DOCUMENT RESUME

ED 075 602 VT 019 826

AUTHOR	Brown, Michael W.; Callahan, W. Thomas
TITLE	The All Volunteer Navy and The Schools: Recommendations for Integration of Navy Careers into Career Education. Final Report.
INSTITUTION	Operations Research, Inc., Silver Spring, Md.
SPONS AGENCY	Office of Naval Research, Washington, D.C. Personnel and Training Research Programs Office.
REPORT NO	ORI-TR-764
PUB DATE	12 Feb 73
NOTE	196p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Career Education; Career Opportunities; Career Planning; *Feasibility Studies; *Integrated Curriculum; *Military Training; *Occupational Information; Orientation Materials
IDENTIFIERS	*Navy Careers

ABSTRACT

This study examined the potential for integrating information on Navy careers into the career education programs which are currently being developed. This integration would result in the presentation of Navy employment information in the same educational context in which employment information on comparable careers in the civilian environment is presented. To verify the feasibility of the study concept and to obtain information either describing career education principles and program developments or describing manpower procurement procedures and Navy occupational information materials, interviews were conducted with key personnel in the U.S. Office of Education, National Institute of Education, and several agencies involved in career education development, as well as key personnel in the Navy and the Office of the Assistant Secretary of Defense. Based on the results of the interviews and the review of materials assembled, the concept of integration of Navy careers into career education was deemed feasible, and recommendations were formulated pertaining to: (1) development of career guidance materials describing occupations and career development opportunities in the Navy, (2) Navy support of career education curriculum, and (3) establishment of linkages between the Navy and agencies involved in career education. (Author/SB)

FILMED FROM BEST AVAILABLE COPY

ED 075602

Technical Report 764

ORI

The All Volunteer Navy and the Schools

RECOMMENDATIONS FOR INTEGRATION OF NAVY CAREERS INTO CAREER EDUCATION

12 February 1973

Prepared under the Navy All Volunteer Force Manpower R & D Program for the Personnel and Training Research Program, Psychological Sciences Division, Office of Naval Research, under Contract No. N00014-72-C-0525, Contract Authority Identification No. NR 156-010

...ared for

...of Naval Research
...ton, Virginia 22217

...duction in whole or in part
...ted for any purpose of
...ited States Government.

...ed for public release; distribution unlimited

...erations Research, Inc. A LEASCO Company

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
OPERATIONS RESEARCH, INC.
1400 Spring St.
Silver Spring, Md. 20910

2a. REPORT SECURITY CLASSIFICATION
Unclassified

2b. GROUP

3. REPORT TITLE
THE ALL VOLUNTEER NAVY AND THE SCHOOLS: RECOMMENDATIONS FOR INTEGRATION OF NAVY CAREERS INTO CAREER EDUCATION

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*
Final Report

5. AUTHOR(S) *(First name, middle initial, last name)*
Michael W. Brown
W. Thomas Callahan

6. REPORT DATE
12 February 1973

7a. TOTAL NO. OF PAGES
193

7b. NO. OF REFS
47

8a. CONTRACT OR GRANT NO.
N00014-72-C-0525

b. PROJECT NO.
NR 156-010

c.

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
ORI TR 764

9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*

10. DISTRIBUTION STATEMENT
Approved for public release; distribution unlimited

11. SUPPLEMENTARY NOTES

12. SPONSORING MILITARY ACTIVITY
Office of Naval Research
Psychological Sciences Division
Personnel & Training Research Programs

13. ABSTRACT

This study examined the potential for integrating information on careers in the Navy environment into the career education programs which are currently being developed within the public education community. This integration would result in the presentation of Navy employment information in the same educational context in which employment information on comparable careers in the civilian environment is presented.

Interviews were conducted with key personnel in the U.S. Office of Education, the National Institute of Education, and several other agencies and organizations involved in career education development, to verify the feasibility of the study concept, and to obtain information describing career education principles and current program developments. Interviews were also conducted with key personnel in the Navy and the Office of the Assistant Secretary of Defense (M&RA), to verify the feasibility of the study concept, and to obtain information describing current manpower procurement procedures and Navy occupational information and career orientation materials.

Based on the results of interviews conducted and the review of materials assembled, the concept of integration of Navy careers into career education was deemed feasible, and recommendations were formulated pertaining to: a) development of career guidance materials describing occupations and career development opportunities in the Navy, b) Navy support of career education curriculum, and c) establishment of linkages between the Navy and agencies and organizations involved in career education.

DD FORM 1 NOV 68 1473 REPLACES DD FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

UNCLASSIFIED
Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Career Education						
Guidance and Counseling						
Career Development						
All Volunteer Navy						
All Volunteer Force						
Manpower Procurement						
Intergovernmental Relations						
Diffusion of Innovation						
Functional Integration						

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

OPERATIONS RESEARCH, Inc.

SILVER SPRING, MARYLAND

The All Volunteer Navy and the Schools

RECOMMENDATIONS FOR INTEGRATION OF NAVY CAREERS INTO CAREER EDUCATION

12 February 1973

Prepared under the Navy All Volunteer Force Manpower R & D Program for the Personnel and Training Research Program, Psychological Sciences Division, Office of Naval Research, under Contract No. N00014–72–C–0525, Contract Authority Identification No. NR 156–010

Approved for public release; distribution unlimited.

ACKNOWLEDGMENTS

This study was conducted with the valuable assistance of numerous key individuals in the Navy, the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs, and the education community. ORI acknowledges the assistance of Dr. Marshall Farr, Director of Personnel and Training Research Programs for the Office of Naval Research, who served as the Scientific Officer for this study; and Captain W. J. Loggan of the Plans Department, Navy Recruiting Command, who advised ORI on key sources of information within the Navy. ORI also wishes to acknowledge the assistance of Dr. Ralph Canter, Director of Manpower Research, OASD (M&RA) (MR&U), for coordination of this study with other related OASD interests and efforts.

In the education community, ORI was assisted by many administrators and specialists in the U.S. Office of Education and the National Institute of Education who are closely involved in the development of career education concepts and programs; by public educators at the state and local levels; and by representatives of a variety of advisory groups and professional associations supporting career education development. These key individuals who contributed to this study, and the nature of many of their contributions, are cited in the text of this report.

Further, ORI acknowledges Messer Associates of Silver Spring, Maryland, for their review of career clustering systems, as presented in Section III of this report.

ORI wishes to express its appreciation to all involved in this effort.

SUMMARY

BACKGROUND

The emergence of the All-Volunteer Navy and the need for the Navy to compete in the free labor market are occurring at the same time as the rapid growth of the career education movement in the nation's public school systems. The possibility exists that linkages between the Navy and career education programs could benefit both Navy manpower procurement and career education programs.

PURPOSE

The objectives of this study were to assess the feasibility of establishing linkages between the Navy and career education, and to provide the Navy with recommendations as to how such linkages could be established.

STUDY APPROACH

The study approach consisted of:

- Interviews and other communication with 60 experts in the fields of education, guidance, Navy manpower procurement, and Department of Defense manpower policy, to verify the desirability of Navy support for career education.

- Reviews of available information on the career education activities of the U.S. Office of Education (USOE), the National Institute of Education (NIE), and reviews of other state, local, and private programs of career education and career development.

- Review of Navy manpower and recruitment materials and procedures, to determine the degree of their conformity with career education standards.

- Generation of recommendations based on analysis of the findings of the interviews, the review of career education, and the review of Navy manpower procurement efforts.

Study Rationale

This study is based on the premise that the Navy, within the AVF context, must compete for labor in the free market. The Navy is changing to meet the requirements of this competition. Evidence is adduced, however, which indicates that Americans may ignore the changes in the Navy because important channels of information exclude the Navy and other military services from discussions of employment opportunities for various skills. Because of the end of the draft, the Navy may be able to integrate its work opportunities, skill-by-skill, into information on all other opportunities in the American economy. The public school systems, because of their occupational guidance role, may play an important part in integrating the Navy, as an employer with a unique environment, into Americans' perceptions of the total of American work. Public schools' adoption of career education principles, which require that students become aware of *all* opportunities for work, provides the Navy with a clear opportunity to increase the credibility, receptivity, and effectiveness of its approaches to schools. Navy actions in support of career education, furthermore, can benefit both the Navy and the students in the public schools.

FINDINGS AND RECOMMENDATIONS

1. The integration of Navy career information into career education programs is feasible. Career education, as an approach to education, appears likely to continue to grow. Educators and Navy personnel concur that Navy support of career education is desirable because it will benefit both the Navy and the education community. Many current Navy materials and procedures can be modified, at reasonable cost, to provide high quality inputs to career education programs.

2. The growth of career education is occurring at a pace which will both permit and require continuing support from organizations outside the school system. It is recommended that the Navy, in its role as a major employer, provide such support where appropriate.

3. In general, career education programs, like many other segments of American society, have not yet recognized the importance of the Navy and other military branches as components of life-long career education. To increase interest in the diversity of Navy work, it is recommended that the Navy should emphasize that the Navy's pay and benefits, which are widely advertised, are the just reward for challenging, demanding work well done.

4. Educators recognize the quality of Navy training materials and have expressed a desire to use more of them in the public schools. Accordingly, it is recommended that the Navy make such materials more readily available, and that specific career education curriculum materials be developed.

5. Preliminary analysis indicates that most Navy work specializations have clear counterparts in civilian institutions. The clearest differences between the military and civilian portions of American society seem to involve characteristics of the social environment, rather than work specializations. It is recommended that the Navy take action to ensure that its career opportunities are described at the same time and in the same manner as civilian opportunities that include the same career specializations. At the same time, the Navy should undertake research in two areas. First, the apparant similarity between Navy specializations and occupations in civilian life should be verified. Second, the Navy should define the ways in which the Navy environment can be compared to, and contrasted with, the civilian work environments.

6. Educators who have been introduced to the concept of integrating Navy careers into career education programs are unanimously in favor of the concept. As a result, it is suggested that the Navy can rely on support from the education community for any Navy efforts to adopt a valid career education approach to school systems.

7. Educators warned that any Navy attempts to construct a valid career education approach to schools must be education-oriented. That is, it should be devoid of recruiting flavor. ORI recommends, therefore, that any Navy materials which may be produced to integrate Navy career information into career education programs merely provide an accurate picture of Navy work and the Navy way of life; its disadvantages as well as advantages.

8. The success of a Navy career education approach will depend on coordinated action by many Navy organizations. It is recommended that the Chief of Naval Operations consider initiation of such coordination. The development of a coordination plan is also recommended.

9. Career education developments and current Navy efforts allow for the development of career guidance materials that will expedite integration of Navy work with perceptions of civilian work. Several of these are recommended and described in detail. The most important opportunities consist of revising current descriptions of Navy career opportunities for use in career guidance

materials, and attempting to integrate Navy opportunities, by occupation, into the *Occupational Outlook Handbook* of the U.S. Department of Labor.

10. Opportunities also exist for the revision and direct use of Navy training materials in public school systems, both to exemplify Navy work and to provide needed inputs to the overall career education program effort. In this report, ORI recommends and describes several ways in which this might be accomplished.

11. Career education also provides the opportunity for the Navy to increase the frequency and significance of its liaison activities with other agencies and institutions that are involved in career education. Both agencies to be involved, and objectives of liaisons, are discussed in this report.

TABLE OF CONTENTS

		Page
	SUMMARY	v
	LIST OF ILLUSTRATIONS	xi
I.	STUDY APPROACH	1
	INTRODUCTION	1
	STUDY OBJECTIVES	2
	RESEARCH METHOD	2
II.	RATIONALE UNDERLYING STUDY: CAREER EDUCATION AND THE ALL VOLUNTEER NAVY	9
	INTRODUCTION	9
	THE CHANGING NAVY	11
	PERCEPTIONS OF THE CHANGING NAVY	20
	OVERVIEW OF CAREER EDUCATION APPROACH	27
	CAREER EDUCATION AND PERCEPTIONS OF THE NAVY	35
III.	CAREER EDUCATION RESEARCH AND DEVELOPMENT	39
	BACKGROUND	39
	MODEL I: THE SCHOOL-BASED MODEL	40
	MODEL II: THE EMPLOYER-BASED MODEL	50
	MODEL III: THE HOME/COMMUNITY-BASED MODEL	57
	MODEL IV: THE RURAL RESIDENTIAL MODEL	59
	EXEMPLARY AND RESEARCH AND DEVELOPMENT PROJECTS	61
	EXAMPLE OF STATE LEVEL DEVELOPMENT	68
	EXAMPLE OF DEVELOPMENT AT LOCAL LEVEL	74
	EXAMPLE OF UNIVERSITY DEVELOPMENT	80
	OCCUPATIONAL CLUSTERING SYSTEMS	81

IV. FINDINGS AND RECOMMENDATIONS 101

INTRODUCTION 101
GENERAL FINDINGS AND RECOMMENDATIONS 104
RECOMMENDATIONS FOR NAVY ACTION 110
POTENTIAL UTILITY OF NAVY CAREER MATERIALS IN CAREER EDUCATION MODELS 139
SELECTED SIGNIFICANT RECOMMENDATION 143
IMPLEMENTATION COST ESTIMATES 145

APPENDIX A: NAMES AND AFFILIATIONS OF EDUCATION AUTHORITIES INTERVIEWED A-1

APPENDIX B: NAMES AND ORGANIZATIONS OF DEPARTMENT OF DEFENSE PERSONNEL INTERVIEWED B-1

APPENDIX C: EXAMPLE OF OCCUPATIONAL MATERIAL FOR CAREER EDUCATION C-1

APPENDIX D: PROTOTYPE OF NAVY CAREER EDUCATION CURRICULUM MATERIAL D-1

APPENDIX E: ARTICLE FROM *INFORM*, NATIONAL CAREER INFORMATION CENTER'S MONTHLY NEWSLETTER . . E-1

LIST OF ILLUSTRATIONS

Page

Figure

1. Current Information Flows Influencing Navy Enlistment and Reenlistment 13

2. USOE Representation of Broadening Career Education Activities 30

3. Effect of Career Education on Information Flows Influencing Navy Enlistment and Reenlistment 36

4. CCM Matrix 42

5. Example of CCEM Element 44

6. Pages From an Anne Arundel County Curriculum Design Manual 78

7. First Component of the Career Information System 89

Table

1. Relationship of USOE Career Clusters and Selected Navy Ratings 32

2. Exemplary and Research and Development Projects in Career Education, By Project Emphasis and Stage at Which Developed 62

3. Summary Comparison of Characteristics of Selected Clustering Systems 95

4. Comparison of Similarity in Cluster Categories Across Selected Clustering Systems 97

5. Cost Requirements by Category for Recommended Actions . . 146

STUDY APPROACH AND RATIONALE UNDERLYING STUDY

I. STUDY APPROACH

INTRODUCTION

This report describes the study of potential integration of Navy careers into career education programs as performed by Operations Research, Inc. (ORI) in support of the Navy's All Volunteer Force Manpower Research and Development Program, and as part of the Office of Naval Research (ONR) Program in Manpower Research and Development. This first section discusses the objectives of the study and ORI's approach to its conduct. The subsequent sections in the report describe in detail the rationale underlying the study, the career education programs of interest to the Navy, and the findings and recommendations that resulted from the study.

The study concept was originally developed by ORI in response to an ONR request for studies to support and improve planning and policy making in manpower/personnel areas, in anticipation of problems of implementing the All Volunteer Force (AVF) policy. In the study concept, ORI proposed that the Navy examine the career education programs that are currently being developed within the public education community to determine the potential of these programs for full integration of information on occupations in the Navy with current information on comparable civilian occupations. The study concept was based on the fact that, while the draft has existed, information on Navy and other military opportunities for career pursuit has, for a number of reasons, been presented to students separate from information on comparable civilian opportunities, usually in a recruiting context. ORI proposed that, with the elimination of the draft, Navy career information could be integrated with information on comparable civilian careers, and presented in the more credible context of the public education system. ORI proposed that such integration of Navy career information would create an awareness, on the part of a greater number of young people, of the Navy as an employer, and would establish the Navy as a unique working environment in which a variety of individual careers (most of which are also found in the civilian working environment) can be pursued.

Following submission of the proposal to investigate this concept, ORI reviewed the concept with members of ONR's Planning Committee for Programs in Manpower Research and Development, and with personnel in the Navy Recruiting Command. These reviews served to clarify the purpose of the proposed study, enlisted the Navy's support for it, and provided ORI with guidance concerning the conduct of the study.

STUDY OBJECTIVES

As described in ORI's original proposal, and as developed through discussions with ONR and other cognizant Navy personnel, the basic objectives of this study involved: (a) verification of the feasibility of integrating Navy career information into career education; (b) comparison of existing Navy career information with career education criteria; and (c) development of recommendations for Navy actions concerning new information, materials, and procedures necessary to achieve Navy-career education integration.

At the outset of the study, ORI determined that the feasibility of the study concept would be adequately evidenced if: (a) the concept was readily comprehensible to both the key career educators and the Navy personnel contacted; (b) the concept was clearly acceptable to the individuals contacted; (c) Navy career information was reasonably compatible with career education requirements; and (d) estimated Navy costs to implement recommended actions were not excessive.

Throughout the study, ORI sought to contact individuals who could contribute to the verification of the feasibility of the study concept in light of these criteria, and who could contribute to the content of recommendations to the Navy concerning utility of current Navy information and practices, and needed revision and new development of information and practices.

During the study, ORI was also able to develop and articulate the concept of Navy-career education integration more fully, and to identify many implications of the concept for Navy organizations, other military branches, and the education community. While the purpose of further developing the concept and its implications as part of this study was essentially to provide a context in which study recommendations could be evaluated by the Navy, ORI believes that the concept and implications, as presented in Section II of this report, are a highly significant part of this overall study effort.

RESEARCH METHOD

The conduct of this study involved three basic operations that align with the three study objectives previously cited. These operations are described in the following paragraphs.

Interviews with Experts

To assess both comprehensibility and acceptability of the Navy-career education concept, and to obtain referrals to sources of career education and Navy career information, ORI contacted and interviewed key personnel in the education community and in appropriate Navy organizations. Interviewees were selected based upon ORI's knowledge of career education development at the federal level, and with the assistance of the National Advisory Council on Vocational Education, the U.S. Office of Education, the National Institute of Education, the Office of Naval Research, the Navy Recruiting Command, and the Bureau of Naval Personnel.

The personal, open-ended interviews conducted by ORI were patterned after techniques for specialized interviewing described by Dexter for use in studies of this nature.[1] Four basic conditions suggested that this interview approach be utilized. First, while the career education concept itself is broad in scope, it is not yet fully disseminated, so that quantitative surveys of opinion concerning Navy integration into programs could not be expected to yield meaningful results. Second, because ORI staff had sufficient understanding of both career education and the Navy, they could develop and pursue the lines of questioning required for effective interviewing of experts. Third, ORI staff had sufficient experience in the conduct of interviews of this nature. Fourth, prior to contracting to perform this study, ORI had verified the willingness of both career educators and Navy personnel to participate in interviews on the study subject.

Reviews of Career Education Research and Development, and Navy Career Information

ORI staff reviewed the literature on current career education developments that were judged significant by the experts interviewed. The purposes of the review were to develop standards for Navy materials and procedures that would facilitate the integration of Navy information into career education programs, and to provide the Navy with a report on the current status of career education research and development. The review of career education developments was intended to be completed, for the most part, before the review of Navy materials and procedures began.

The review of the Navy materials and procedures for providing career information had one objective: to start from what the Navy had already prepared, and to suggest *revisions* that would align materials more closely with the standards identified in the review of career education. That is, new departures would be suggested only when ORI identified needs in the career education programs which the Navy, by additional effort, could help to fill, or where ORI identified conditions in the Navy that would hinder its participation in career education.

---

[1]Lewis Anthony Dexter, *Elite and Specialized Interviewing* (Evanston, Ill.: Northwestern University Press) 1970.

ORI's reliance on revision of existing materials was prompted, first, by the recognition that the Navy had a large number of training programs and career opportunities already related to career education. For this reason, even before the materials were reviewed, ORI could predict with some assurance that some Navy materials, with appropriate revision, would be useful in career education. Second, it was recognized that revision of existing materials would be more understandable and more readily acceptable to the Navy than the development of entirely new materials or programs. The third consideration was the continuing need for economy as well as effectiveness in Navy initiatives to assure successful manpower procurement in the all-volunteer mode.

Generation of Recommendations

The final operation in the study consisted of formulating recommendations to the Navy based on the comparison of Navy materials and procedures with the standards and needs of the career education movement. When the study was originally proposed, ORI staff members anticipated that the formulation of recommended Navy actions would consist of merely analyzing the Navy efforts in light of the career education approach and making one conform with the other. Although that process did suffice as a method for developing the recommendations, an additional effort was required in order to present the recommendations to the Navy in a fully comprehensible context. ORI recognized the necessity of describing, in some detail, the concepts which underlie the study of Navy integration into career education. While not based on exhaustive research, ORI believes that the concepts do reflect sound perceptual psychological and learning theory principles. ORI staff, in interviews and in literature review, sought information or studies that would contradict the study concepts or cast doubt on the advisability of the Navy-career education approach. Such negative information was not found. Rather, the interviews conducted and several documents reviewed reinforced ORI's initial perception that the study concept was sound. While additional research may be desired by the Navy in implementing certain recommendations, ORI presents the recommendations in this report with some confidence.

Performance of Study Tasks

The three basic operations described in the preceding paragraphs were implemented by ORI through the following study tasks.

Review with Career Education Administrators. ORI presented the concept of integration of Navy careers into career education programs to administrators in the U.S. Office of Education (USOE) and the National Institute of Education (NIE). These administrators were chosen on the basis of their involvement in, and perceived importance to, the development of career education in the public education system.

The presentations to these administrators enabled the ORI staff to estimate educators' interest and willingness to pursue the concept, and provided vital information concerning the current status of career education development, as well as the names of additional individuals who are important to career education growth.

Interviews with USOE and NIE personnel also enabled ORI to obtain as much career education information as is currently available on the four major Career Education Models, and on other programs developing through local and state education agencies. To investigate career education developments further, ORI staff conducted site visits and interviewed key personnel at the Ohio State University Center for Vocational and Technical Education, the Southern Illinois University Career Development for Children Project, and the Anne Arundel County and Prince Georges' County, Maryland, school systems.

As each interview with education administrators was completed, it was analyzed for its importance to the project and to the concept of Navy-career education itself. Based upon the interviews, ORI staff revised the concept as appropriate and informed ONR of important developments in the project. As a result, the concept and the final report presented here began to take shape very early in the project. This process of ongoing revision and growth proved useful, especially in preparing monthly reports, briefings, and information packages to educators and other interested parties during the study.

The interviews with USOE and NIE officials led ORI staff to two groups of organizations whose inputs to the study had not been fully anticipated when the study was proposed. Several key educators urged ORI to contact associations of education and guidance professionals, and commercial publishers of guidance materials. These associations and firms were viewed as extremely important as advisors and as potential disseminators of information concerning future attempts to integrate the Navy into career education.

Finally, the consultations with educators repeatedly pointed to the need for ORI to involve the Office of the Secretary of Defense in the study. ORI staff reported this suggestion to ONR, and with the approval of ONR, ORI discussed the concept with personnel of the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

To assist the readers of this report in further examination of both career education in general and the Navy-career education concept, ORI has listed in Appendix A the names and affiliations of ORI study contacts in the education community.

Review of Career Education Methods and Materials. Based upon interviews with educators, the ORI staff collected a number of descriptions of the career education concept and various programs which are actual implementations of the concept. Contrary to ORI's expectations, however, the quantity of instructional materials available was minimal, due to the hesitancy of professional educators to release materials before they had been fully tested.

ORI analyzed the materials that were available to identify the teaching and guidance techniques being used in career education, and the formats in which occupational information can be most effectively presented. Wherever appropriate, ORI personally contacted career education project personnel to verify and clarify aspects of projects and to discuss the concept of integrating Navy careers into the projects and materials.

Descriptions of the four major Career Education Models, other federal career education projects, and examples of state, local, and university programs examined are contained in Section III of this report.

Review with Department of Navy Personnel. ORI staff interviewed Navy personnel in the metropolitan Washington area and discussed the concept further through telephone and written communications with Navy personnel in other locations. The personnel interviewed represented the Bureau of Naval Personnel, the Navy Training Command and the Navy Recruiting Command. Those interviewed were involved in Navy programs related to AVF.

Navy personnel provided ORI staff with all information they deemed appropriate to assure adequate understanding of Navy occupations, career ladders, and skill requirements. They also identified and furnished to ORI materials used in recruiting, and descriptions of recruiting procedures. One of the major contributions of the interviewees was to emphasize the interrelationships between the Navy mission and Navy personnel, recruiting, and training efforts.

Personal contact with Navy representatives proved very important, for two reasons. First, the interviews quickly informed these key Navy personnel of the concept, and stimulated both support for it and cautionary prescriptions concerning its implementation. Second, the interviews brought focus to ORI's attempts to review materials, because Navy personnel identified materials which, although available, are not currently in use. As a result ORI was able to identify the procedures and documents which would form the core of any potential attempts to implement a Navy-career education approach.

Interviews with members of the Navy Recruiting Command enabled ORI to classify recruiting materials for purposes of comparison with the needs of career education. Although ORI had anticipated the need for extensive classification of recruiting materials by environment, media, and target population, interviews with Recruiting Command personnel indicated that such complexity was not justified. The relationship of the Navy (and other services) to schools and students is established in four basic environments: schools (e.g., career nights), recruiting stations, Navy ships and facilities (through visits by students and educators), and through printed media.

The media currently used by the Navy in its recruiting efforts appears to stress printed manuals, brochures, posters, bumper-stickers, and billboards and periodicals, although performances by the Navy Band, the

Blue Angels, etc., probably have some recruiting value. The recruiting approach which has by far the greatest potential for integration with career education is the *United States Navy Occupational Handbook* (commonly called the "Career Planner").

Discussions with Navy personnel confirmed both the desirability and feasibility of expanding the current practices and materials, and modifying them to conform more closely to career education requirements.

Navy and other Department of Defense personnel interviewed during the study are listed in Appendix B.

Comparison of Navy Career Descriptions with Descriptions Under Development for Career Education. Review of Navy and Office of the Secretary of Defense career descriptions focused on the following documents.

- *Manual of Qualifications for Advancement* (NAVPERS 18068C, June 1971)
- *Manual of Navy Enlisted Classifications* (NAVPERS 15105-V, January 1972)
- *Manual of Navy Officer Classifications* (NAVPERS 15839B, August 1972)
- *Military-Civilian Job Comparability Manual*, Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs).

A review and comparison of these materials with career education materials showed that the Navy and other DOD documents already contained enough basic information to describe Navy career opportunities as they relate to career education. ORI determined, however, that more effective integration of Navy careers could be achieved if some of the basic materials were used more fully. Section IV of this report includes ORI's recommendations concerning preparation of more complete descriptions of career opportunities and skill requirements.

Another aspect of the review of these materials involved actual recruiting documents, to determine the extent to which they conform with career education needs. Although some of the current documents could be used more fully in career education programs, ORI also developed recommendations for modification of these materials. A series of procedures which the Navy can implement to strengthen its relationships with career education programs was also developed, and is also included in Section IV.

Verification of Concept and Recommendations. As the Navy-career education concept developed, and as, during the study, recommendations for Navy action were formulated these were discussed with the educators and Navy personnel as contacted. Because the bases for most recommendations were actually generated in the initial interviews with educators and Navy personnel, verification of the desirability and feasibility of the recommended actions was accomplished throughout the study. Because the initial reactions of individuals contacted to the concept were uniformly favorable, the need for further verification of recommendations was minimal.

II. RATIONALE UNDERLYING STUDY: CAREER EDUCATION AND THE ALL VOLUNTEER NAVY

INTRODUCTION

This study was sponsored by the Office of Naval Research and conducted by ORI in recognition of three general conditions that have developed in contemporary American society. These conditions, which will be discussed in this section of this report, may be summarized as follows:

a. The advent of the All Volunteer Force (AVF) is a significant social change that will require changes in Navy policies and procedures and will also require the development of new perceptions of the Navy by Americans.[1]

b. The growth of career education as an approach to public education is also a significant social change that will result in changes, not only in public school systems, but also in individual and institutional behavior.

c. The need for change in perceptions of the Navy can be facilitated by career education programs, and inclusion of the Navy in these programs is a necessary condition for the complete success of career education.

---

[1]The conditions which accompany AVF became fully effective on 27 January, 1973, when Secretary of Defense Laird announced suspension of the draft, five months ahead of schedule.

AVF Requires Many Changes

The Navy and the other service branches have already taken steps to improve their pay schedules, benefit and entitlement packages, working conditions, and administrative procedures in anticipation of AVF. New recruiting and public relations efforts are also proceeding. These steps are highly appropriate to the task of establishing the Navy as an attractive competitor for qualified personnel in the free labor market.

It is obvious, however, that these changes occur and are now publicized in a social system that is accustomed to an old perception of the Navy, i.e., not as an employer in the free labor market, but as either a cadre of detached elite or as a quasi-voluntary alternative to involuntary service in another military branch. Accordingly, attempts to communicate the facts concerning the free market attractiveness of the Navy will probably confront a perceptual barrier. Although the Navy is competing as an employer, young citizens may exclude the Navy from their perceptions of the market for career pursuit opportunities. The Navy's ability to hire a sufficient number of qualified personnel in a voluntary configuration will be determined to a large extent by society's ability to overcome outmoded perceptions of the Navy and to communicate new perceptions to many young people; first, that the Navy is a truly competitive employer, and second, that the Navy is an attractive employer. This, of course, assumes that the Navy is or will become as attractive as is necessary to compete, without detracting from achievement of the Navy's mission.

The school systems of the nation can assist in developing an accurate awareness of the Navy as an employer with certain attractive, as well as relatively unattractive, attributes. The opportunity for the schools to provide this form of education has never been more auspicious than in the current period. The suspension of the draft and the concomitant growth in the attractiveness of the Navy enable educators to describe opportunities in the Navy in a new light. At the same time, school systems are developing and adopting a broad new educational approach, called career education. Career education is better suited to presentation of Navy (and all other) career opportunities than any previous popular approach to public education.

Career Education Focuses on Preparing for a Productive Life

The objective of career education, as stated by Sidney P. Marland, U.S. Commissioner of Education, is "that every young person completing our school program at grade 12 be ready to enter higher education or to enter useful and rewarding employment."[2] Since that objective was first proposed in early 1971, Commissioner Marland has made career education the primary innovative concern of the U.S. Office of Education (USOE). To develop and implement the concept of career education, USOE is currently sponsoring extensive research, development, and demonstration projects.

---

[2]Sidney P. Marland, "Career Education Now," an address to the 1971 Convention of the National Association of Secondary School Principals, January 23, 1971.

Career education seeks to provide, at every stage of students' development, information and experiences that will stimulate and enable students to compare their own self-concepts with their concepts of all types and levels of work. Career education begins in the elementary grades and continues through junior and senior high school and beyond. Students receive instruction in the various academic and vocational disciplines, coupled with career orientation and guidance--all keyed to repeated, tentative choices of broad "clusters" of careers, and eventually, specific occupations. The iteration of this process of learning and choosing several times throughout the school years is intended (a) to increase the motivation to learn, (b) to increase learning itself by providing a useful frame of reference, (c) to increase student awareness of the many different opportunities for productive behavior and the continued development of career skills, and (d) to increase student decision-making capability relative to career choices.

Career Education Is of Interest to Both Navy and Education Community

The previous discussion clearly suggests that the interests of the Navy overlap with those of educators in the development of career education. The public school system, especially in the career education mode, is probably the best available setting for developing an awareness of the Navy as an employer in the free labor market. At the same time, the Navy represents a large and diverse portion of the universe of work and provides a significant (in terms of national labor force) number of entry level opportunities each year. Educators cannot regard career education as competely successful if they fail to integrate the broad range of Navy opportunities into their programs. Thus, as ORI has indicated, the concurrent development of AVF and career education has produced a classic opportunity for cooperation between the Navy and the education community based on mutual interest and benefit. The interests of both parties would clearly be served by integrating Navy careers into career education programs.

THE CHANGING NAVY

The Navy has recognized the implications of the elimination of the draft for several years. The growth of the AVF concept, therefore, has been accompanied by many changes within the Navy itself. At the organizational level, for example, training functions have been unified under the Chief of Naval Training, and the Navy Recruiting Command, because of the needed new emphasis on recruiting, has been separated from the Bureau of Naval Personnel. Achievement of the Navy mission within the constraints of reduced force levels has been analyzed and planned. Several Navy administrative and personnel policies and procedures have been modified to make the Navy environment more responsive to the expressed needs of "true volunteers."

A full recounting of all of the changes the Navy has made in anticipation of AVF is outside the scope of this study. It is sufficient to say that ORI's study acknowledges that the Navy is changing and will change in ways that will advance (and not retard) achievement of the Navy mission. This study also proposes that the success of the Navy in the AVF

context may depend not only on changes within the Navy, but also on changes in American society outside the Navy and on the increased integration of the Navy into society in general.

Importance of Accurate Perceptions of the Navy

The success of AVF will depend, to a great extent, on the many steps taken by the Navy to make employment in the Navy attractive in a completely objective sense. In a more subjective context, however, an equally necessary development is that the nonmilitary portion of society must perceive the Navy in an accurate way. As will be explained, it seems imperative that society's perceptions of the Navy must center on the fact that the Navy is an employer of workers in many specialties.

The extent to which the Navy's success in AVF depends on accurate perceptions of the Navy within society cannot be estimated fully within the scope of the present study. However, by focusing only on the subjects of communication and feedback between the Navy and the nonmilitary population as they affect enlistment and reenlistment decisions, a useful discussion can develop.

Figure 1 is intended to portray a conceptualization of the interactions of the Navy and nonmilitary populations relative to enlistment and reenlistment decisions. The interactions described in the figure are very similar to those treated by Deutsch in his analysis of the behavior of states.[3]

Although Deutsch's article specifically addressed interactions between nation-states in the international system, his model seems appropriate in this context as well. A change in Navy policy concerning integration into career education will have an influence on the nonmilitary portion of society. Furthermore, there is, apparently, a certain operational boundary between the Navy and the rest of society, if we accept Deutsch's definition of boundaries--"marked discontinuities in the frequency of transactions and marked discontinuities in the frequency of responses." Although ORI recognizes that the boundaries between the Navy and the rest of society are different from those which separate nation-states, the analogous aspects of the two situations are noteworthy and make Deutsch's construct useful to the present study.

Members of the total Navy population, represented at the top of the figure, are provided work experience, specialized training, non-specialized training (education), and personal career counseling; they receive job satisfaction and other intrinsic benefits, as well as financial rewards and entitlements. These experiences and rewards, moreover, are inseparable from a specific Navy environment, consisting of the Navy mission, chain of command, administrative procedures, physical working environment, and activities afloat and ashore.

---

[3]Karl W. Deutsch, "External Influences on the Internal Behavior of States," *Approaches to Comparative and International Politics*, ed. R. Barry Farrell (Evanston: Northwestern University Press, 1966) pp 5-26.

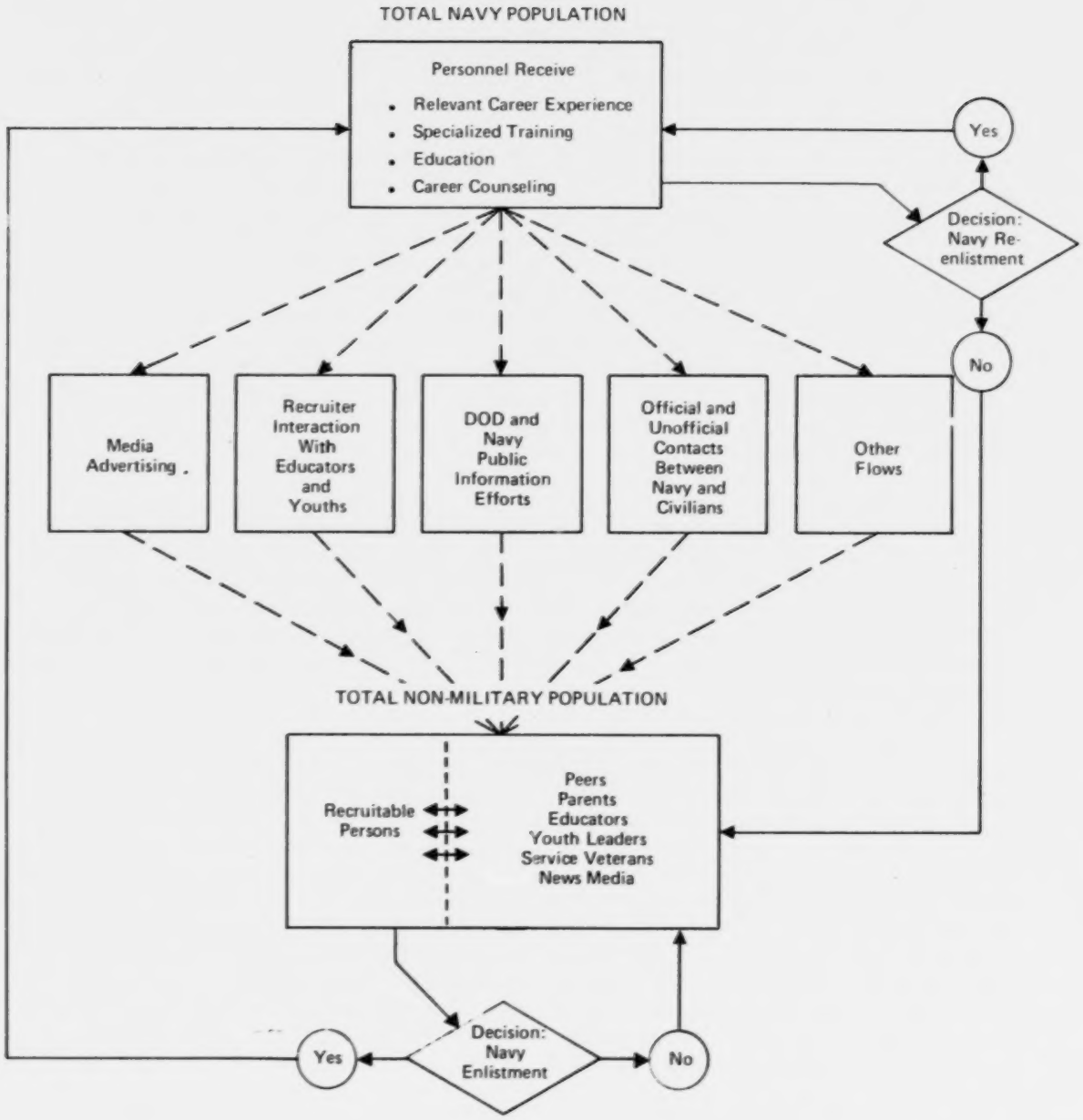


FIGURE 1. CURRENT INFORMATION FLOWS INFLUENCING NAVY ENLISTMENT AND REENLISTMENT

The concept developed in this report is based on the hypothesis that many of the experiences, rewards, and environmental attributes of the Navy as an employer can be manipulated, within mission constraints, to make the Navy attractive. An equally important hypothesis is that enlistment and reenlistment decisions will be favorable to the Navy if the number of citizens with accurate perceptions of the Navy is maximized. Thus, Figure 1 emphasizes only the hypothesized enlistment/reenlistment value of accurate perceptions, although ORI recognizes that accurate perceptions of the Navy may serve many other purposes of great value to society.

It is in the interest of the Navy to establish accurate perceptions of the Navy within the nonmilitary population (shown in the lower half of the figure), especially among members of that population who are potentially recruitable. Recruitable persons are all those who are, or will be, qualified by age and mental, physical, and moral condition for Navy service. The inclusion of all qualified persons must be emphasized within the context of a fully voluntary Navy, which employs persons of many grades in various specializations. It seems imperative that the Navy not limit itself to competing for the services of any single group in society. Of course, this does not suggest that certain groups will not find the Navy more attractive than *others will*. ORI only wishes to stress that Navy life should appeal to *some* members of every group.

Also of importance, by extension, are those who have significant influence on these potentially recruitable persons. These influential people include peers, parents, educators, and leaders of youth groups. Not to be overlooked are others in society, including persons currently in the Navy or other services, service veterans and the media. The interaction of these members of society with potentially recruitable members indicates that as many as possible should achieve and communicate accurate perceptions of the Navy.

Two groups that play an important role in establishing accurate perceptions are (1) those who make negative decisions concerning enlistment and (2) those who make similar decisions about reenlistment. To some extent, they will communicate to the nonmilitary portion of society their reasons for not enlisting or reenlisting. These reasons will involve, essentially, their perceived inability to match their own interests and traits with those they perceive to be required by the Navy. Again, it is in the Navy's interest to assure that those who make negative enlistment and reenlistment decisions perceive the Navy, and describe its relative disadvantages (for them), accurately. Since they have the appearance of speaking with the authority of those who have given the Navy serious consideration, their reports of their perceptions of Navy life may be influential with potentially recruitable persons.

A much more active source of information, of course, is the Navy itself. The Navy disseminates information concerning Navy life through several channels. This information is represented on the diagram by the broken lines, which pass through several Navy channels to the nonmilitary portion of the society. These channels, as shown on the diagram, include the following.

- Recruiting advertising in the printed or electronic media

- Direct recruiter-potential recruit interaction; this includes both group meetings, such as "career night" in schools, and individual interviews

- Recruiter-educator interactions; this consists of all contacts between recruiters and school officials, teachers, and guidance counselors to increase, clarify, or correct communications between educators and students concerning Navy life

- U.S. Navy Office of Information activities, including news releases

- Department of Defense Office of Information activities

- Direct contact of individual Navy Commands with the public; this includes both group contacts, such as performances by the Navy Band or the Blue Angels, and personal contacts in response to inquiries, interviews, investigations, etc.

- Direct unofficial contacts of Navy personnel with members of the nonmilitary portion of society.

If the Navy is to be perceived accurately by citizens, each of these channels must carry accurate information. Furthermore, accurate perceptions will be reinforced if the channels carry information on a similar theme or involving similar topics. Contradiction of information in any one channel by information carried in another creates distortion and may undermine the credibility of the information and of the channels themselves.

Within the context of integrating Navy careers into career education programs, therefore, a major goal will be to assure that all channels, not just the schools, carry accurate, balanced information about the Navy as an employer.

While not included in the foregoing discussion of information channels, it is recognized that additional information concerning the Navy is transmitted by motion pictures, television, and printed fiction produced for the purpose of entertainment. These do not convey entirely accurate information; they are intentionally distorted to achieve the objectives of the dramatist, or as such, they focus on individual characters rather than on the Navy environment. Many are historical in content when they are produced, so that even their limited information content is outmoded. Others describe conditions that were current in the Navy when they were produced, but are now historical artifacts and are obsolete. Each of these, while providing entertainment, may also provide certain important social

lessons concerning the rigors of war, the need for courage, the temptation of cowardice, etc. It is doubtful, however, that they carry much detailed information about the real challenges and characteristics of normal Navy life in the 1970s.

Histories, although devoted to objective presentation of facts, may also be misperceived as reflecting the current situation in the Navy. News media reports, if well done, are probably the most accurate portrayers of Navy life, but they usually focus on one aspect or trend in Navy living. This limited focus, itself, may distort readers' or viewers' perceptions.

It follows that Navy portrayals of Navy life can never be completely accurate given constraints of language and media, but the Navy can influence its own information sources and require that they strive for a high level of accuracy and balance in describing Navy life.

AVF Means Competition for Workers

The implementation of AVF means that the Navy, regardless of its distinctive characteristics, must compete with many other public and private employers for the services of qualified (or potentially qualified) personnel. In recognition of this fact, the Navy and the other military service branches have increased pay and benefits, modified working and living conditions, and adjusted administrative procedures to enhance the attractiveness of military service. In economic terms, all of these changes represent the "price" the Navy is willing to pay for labor in the free marketplace.

Awareness of Navy Is Essential for Recruitment in Competitive Market

Although price is the concept central to the law of supply and demand, simply offering competitive wages and benefits as the Navy's "price" may not assure that a large number of qualified workers will enter the market and confront the Navy as a potential employer. Theoretically, the only potential employees who will bargain with the Navy for their services are those who have at least three basic types of awareness:

- Potential employees must be aware that the Navy needs the kinds of services that these potential employees believe they can and want to provide or learn to provide, i.e., their "work specialization."

- They must be aware of the social and physical environment in which Navy work occurs, and this environment must be acceptable to them.

- They must be aware of the pay, training, medical care, educational entitlements, etc., that comprise the Navy's "price." It is important to note that pay and benefits in the Navy may be very attractive, yet still be unknown to some potential employees who may rely on outmoded information.

Only those people who are qualified for Navy service and have these three basic types of awareness can be considered participants in the labor market in which the Navy competes. We cannot estimate the total number of such individuals, but evidence indicates that it is a small percentage of the total number of people who are qualified for Navy service.

At least three major study efforts showed that perceptions of military career opportunities are very often inaccurate. A recent longitudinal survey of a sample of 2,213 high school boys, which included data obtained 1 year after they graduated from high school, has the following findings:

- Those who were in military service most frequently mentioned pressure from the draft [as a motivation for enlistment].[4]

- Those who were not in the service were asked if they had ever seriously considered enlisting. Twenty-four percent of the sample said they had done so. Sixty-one percent of the sample indicated that they had never seriously thought of enlisting. "When pressed further, many of these 61% indicated a strong distaste for the military life style and its emphasis of fighting and killing."[5]

- Advancement, income, and utilization of skills are thought to be better in civilian life than in military life, as do "being one's own boss and controlling one's personal life."[6]

Another study, not of attitudes, but of military knowledge among young men, however, had shown that young men underrate the value of military pay and benefits, and underestimate the nature of military working conditions, hours and vacation allowances.[7]

---

[4]Jerome Johnston and Jerald G. Bachman, *Young Men and Military Service* (University of Michigan, Ann Arbor: Institute for Social Research, 1972), Vol V, *Youth in Transition*, p 156.

[5]*Ibid.*, p 156.

[6]*Ibid.*, p 176.

[7]Jerome Johnston, "The Future Soldier: a Profile of Today's Youth," in *Proceedings of the Army Social Work Current Trends Conference, September 1970*, and cited in J. Johnston and J. Backman, *op. cit.*, p 176.

Comparison of the findings of these two studies seems to justify the following questions:

- If the *knowledge* of the service branches is not very accurate, and tends to err on the *unfavorable* side, is it possible that attitudes toward military service would improve if knowledge improved?

- If the *knowledge* of the service branches' place in the world of work improved, is it possible that more young men and women might seriously consider contracting to work in a branch (enlisting)?

- As AVF has emerged, is it still an accurate perception that the probabilities of advancement, income and utilization of skills and abilities, etc., are better in the civilian than in the military sectors? If accurate data which reflect comparisons of such factors were presented to young people, would their perceptions of the military environment for work change?

A third survey of attitudes to military service, completed in May 1971 and repeated in November 1971, showed the following list of conditions of military service that would deter enlistment (and, presumably, encourage seeking employment in an environment other than the military):[8]

- Extended time away from home
- High risk of injury
- Strict discipline/training conditions
- Poor living conditions for single servicemen
- Lack of career opportunities
- Low level of associates
- Insufficient pay on entering
- Insufficient pay over a long career.

---

[8]Gilbert Youth Research, Inc., *Attitudes of Youth Toward Military Service: A Comparison of Results of National Surveys Conducted in May 1971 and November 1971* (Alexandria, Virginia: Human Resources Research Organization, April 1972), p 39.

The list of deterrent conditions, and the sensitivity of respondents to each item on the list shows current *attitudes toward the service*. The same list and responses, ORI believes, show that these attitudes may be based on at least several grievous misperceptions. Is risk of injury higher in the military service environment? Is there a lack of career opportunities? Is the level (socioeconomic status level, presumably) of associates lower? Is entry pay insufficient? Is pay over a long career insufficient?

This list itself seems to indicate that respondents were relying on *some* perceptions which were accurate with the draft, but many of which are of doubtful accuracy in the AVF context.

If the number of people who are clearly aware of Navy work and training opportunities, Navy work environment, and Navy pay and benefits remains small, efforts to improve these characteristics of Navy life may have little effect on enlistment rates.

If this apparent ignorance is overcome and awareness of Navy life is more widely diffused, all of the attempts to make Navy life attractive are likely to have positive effects on enlistment rates under AVF. Each person who has achieved a mature awareness of Navy employment can evaluate the Navy as a potential employer, and then compare the Navy with all other employers of whom he or she is sufficiently aware. Assuming that the Navy as an employer is substantially attractive, the number of individuals who perceive the Navy as an advantageous employment choice is a function of the number of qualified individuals who are aware of all aspects of Navy opportunity. As this latter number increases, enlistment rates should rise.

The following illustration depicts the importance of accurate perceptions of the Navy. Group A includes all persons who are qualified for Navy enlistment. Group B is the subset that consists of all qualified persons who are also fully aware of the Navy as an employer. Group C is the subset of Group B that consists of all those who are fully aware of the Navy, and also find it to be their best employment alternative (i.e., enlistees).

TOTAL NUMBER OF PERSONS QUALIFIED FOR NAVY ENLISTMENT	TOTAL NUMBER OF QUALIFIED PERSONS WITH AWARENESS OF NAVY AS EMPLOYER	TOTAL NUMBER OF ENLISTEES
A	B	C

Using these groups in the illustration, the growth of the total number of enlistees can be predicted to occur in any of three cases as follows:

Case 1. The size of group B remains constant, but the percentage of group B that finds the Navy the best alternative employer increases.

Case 2. The size of group B increases, but the percentage of group B that finds the Navy to be the best alternative employer remains constant.

Case 3. Both the size of group B and the percentage of group B that finds the Navy the best alternative employer increases.

Case 1 has an inherent weakness. If group B remains small, even if a very high percentage of the group enlists, required manning levels may not be met by enlistments. Thus, it appears that maximizing group B, as in Cases 2 and 3, is a worthwhile, perhaps necessary, task for the Navy to undertake.[9]

PERCEPTIONS OF THE CHANGING NAVY

The Department of Defense has already focused attention on the need for general public awareness of the character of work in the military environment. In his recent report on the AVF to the President of the United States, Secretary of Defense Melvin R. Laird wrote:

> The attractiveness of military service and the capacity to retain qualified career people, is strongly affected by public attitudes toward military service. It is essential that the vital role of the Armed Forces in national security and the many challenges of military life be projected in ways that will enhance public understanding and respect for military people, their profession, and the uniform they wear.[10]

Apparent Problem of Differentiated Perception

Attempts to achieve the goals enunciated by Secretary Laird will probably occur today in a social system in which the Navy is largely perceived as different and separate from civilian society. This differentiation probably reduces both citizen attention that is paid to Navy communication and recruiting efforts, and the credence lent to the military

---

[9]It could also be argued that maximum diffusion of such awareness would be beneficial for social, political, and intellectual reasons apart from the manpower requirements of the Navy. Such considerations, although they are of interest to this study, are outside of its scope.

[10]*Progress in Ending the Draft and Achieving the All-Volunteer Force.* Report to the President and the Chairmen of Armed Services Committees of the Senate and of the House of Representatives (P.L. 92-129). (Superintendent of Documents, U.S. Government Printing Office, August 1972), p 32.

information that is received. The Navy is probably not viewed as an employer offering a specific working environment. Except for those who actively seek information on enlistment opportunities, it is likely that very few young people are aware of the substance of Navy work or of many specific enlisted or officer ratings. "Going in the Navy," in common parlance, is always an alternative to "getting a job," though the fact remains that the first is only a single variety of the second.

Much employment information circulating in society reinforces this differentiation. The Bureau of Labor Statistics separates military job classifications, regardless of their skill content, from civilian job classifications. Unemployment rates and employment projections are computed in terms only of the nonmilitary labor market. Organizations that publish career guidance materials describe several hundred career specifications, each with a separate "career brief." Although many of the specialties described in these briefs are in demand in the Navy, Navy opportunities are almost never mentioned, except in separate briefs having such titles as "Careers in Military Service." This reflects, and at the same time reinforces, the perception that the military branches do not consist of individual specialists, but of "sailors" or "soldiers" who are involved in vague, even mysterious, operations outside the realm of "real work."

Reinforcement is intensified by various school guidance activities. Guidance counselors tend to portray the military services, if at all, primarily as sources of training. Very often, counselors tend to think that dissemination of career information on opportunities in the Navy is the exclusive responsibility of recruiters. Recruiters are associated with all of the negative connotations that may be attached to "selling." One Navy recruiter claimed that the most common view of recruiters among school personnel is that they are "body-snatchers." One text book used at the university level to train guidance counselors took this position on military recruiting: "The deliberate misrepresentation employed by recruiting officers for military services has been notorious for centuries. Gullible counselors have been unwitting partners to the deception."[11] This attitude by counselors reinforces the perception that military opportunities must be completely different from, and probably inferior to, "real jobs." Otherwise, counselors would seek out, demand, and pass on quality information on careers in the military service. Since they do not, students receive information on military occupational opportunities in ways, times, and contexts which are completely different from those in which "civilian" opportunities are presented. Civilian occupations seem proper substance for *counseling sessions*. Military opportunities appear to be suitable only for *recruiting meetings*. The difference is not at all subtle and serves to reinforce student perceptions that military opportunities are utterly "different." (The implication that they are also inferior could follow from this.)

---

[11]Robert Hoppock, *Occupational Information* (New York: McGraw-Hill, 1963), p 46.

The impression that "military service" is different from "work" is so deep that researchers of good reputation tend to reinforce it. The following three examples illustrate that the perception which differentiates military service from work is reinforced even by persons who have extensive training both in education and questionnaire design.

- From "Project Metro:"[12]

  WHICH CAME FIRST AFTER HIGH SCHOOL?
  (Exclude temporary summer job)

  Employed full-time

  Full-time college

  Full-time school (not college)

  Military service

  Marriage and home career

  None of above applies

- From "Study of Community Colleges and Vocational Technical Centers" (Graduate Questionnaire):[13]

  What did you do FIRST after completing your education at the school you attended until June 1967? OMIT SUMMER EMPLOYMENT OR SUMMER SCHOOL.

  Sought work, but was unemployed 0

  Full-time job (35 hours or more) . . . 1

  Full-time school or college 2

  Military service 3

  Part-time school and part-time job . . 4

  Part-time job (1 to 34 hours) 5

  Full-time housewife 6

  Other (Please specify):_____ 7

---

[12]Educational Systems Research Institute, 1969.

[13]Bureau of Social Science Research, 1969.

and, from the same questionnaire:

> Since June 1967, was there any period in which you were NOT AVAILABLE FOR WORK (in military service, full-time school, extended illness, housewife)? CIRCLE ALL THAT APPLY
>
> Have always been available for work . . . 0
>
> WAS NOT AVAILABLE FOR WORK BECAUSE OF:
>
> Military service (____ months) 1
>
> Full-time school (____ months) 1
>
> Illness/disability (____ months) 1
>
> Full-time housewife (____ months) 1
>
> Other (Please specify): _____
> for _____ months 1

In each case, the designers of the questionnaires completely separated military service from work or job. Especially striking is the third example in which military service is portrayed clearly as a condition which interferes with work availability. These examples typify the practice, and reflect the perceptions, of survey researchers in the manpower field. ORI has administered similarly biased questionnaire items on two previous occasions. Only in the era of the draft did the writers of such questions have some logical basis for separating military service from full-time employment.

In late December of 1972, the Secretary of Health, Education, and Welfare released a report entitled *Work in America*. This report included findings of a study concerning the quality of working life and suggestions for improving it.[14] Although the report was prepared by a task force of scholars who have devoted many years to the study of work, work in the armed forces is not mentioned. For some reason, which is not explained, they did not find it necessary to report on ways that the military work environment might be improved. Nor did they describe any military work-improvement techniques that might be transferable for use in the civilian environment.

If *Work in America*, which was justifiably described by the Secretary of HEW, Elliot Richardson, as excellent, omitted the military environment intentionally, it exemplifies the tendency of professionals to be satisfied with accepting the proposition that military service is not a

---

[14] *Work in America*, Report of a Special Task Force to the Secretary of Health, Education, and Welfare, December 1972.

part of America's work, or at least, that work in the armed forces is the concern of the Department of Defense and *not* of the Department of Health, Education and Welfare. In either case, readers of the report may again fail to see the magnitude and significance of military service as *work*, and the authors are willing to allow that failure.

If, on the other hand, *Work in America* omitted work in the American military branches by oversight, the report demonstrates the depth of our perception of military service as something other than work. If eminent professionals, such as the authors and the endorser of the report, with reputations for thinking in societal terms, have overlooked military service as a part of the work of the nation, it seems reasonable to suspect that less sensitive people have also failed to make the connection.

Some educators in the career education field, however, are fully aware that military career opportunities are unjustifiably and incorrectly differentiated from civilian career opportunities. Recently, a contractor charged with devising a cluster of "public service" career opportunities for the U.S. Office of Education rejected the notion that all military specialties be included in that cluster. He realized, of course, that all military personnel are in the public service, but he argued that to subsume all military specialties under "public service" would disguise the variety of skills that military service requires; would reduce the information value of descriptions of military opportunities; would undermine the internal logical consistency of the public service cluster.[15]

ORI's study concept does not dispute the position that the military environment for work is different from the civilian environment.[16] This study does contend, however, that military service is work, that it involves many career specializations, and should be perceived and described as part of the productive activities of society which are usually referred to as work. Unless this integration of the concept of military work with the rest of society's work is accomplished, the Navy will probably find it more difficult to communicate the fact that the Navy is changing. Higher pay, guaranteed schooling, and new administrative policies will not be perceived as positive aspects of Navy employment if the Navy is not first perceived as an employer.

---

[15]Patrick J. Weagraff, Director of Public Service Occupations Curriculum Project, State of California, Department of Education. Dr. Weagraff listed the following major occupational groups in the public service cluster: Resources Management (natural resources), Educational Services, Government Agency Management, Public Safety, Corrections and Judicial Services, Rural/Urban and Community Development, Social and Economic Services, Regulatory Services and Records, and Transportation Management. Although some military specialties fit into this cluster, many do not.

[16]An analysis of the areas in which the Navy (military) environment differs from the civilian environment is recommended by this study as a subject of further research.

The integration of the military service with the total societal work program and manpower allocation mechanism can, of course, be viewed as part of a larger effort. It has been argued in the context of AVF that *all* of the boundaries between the military and civilian social subsystems must be reexamined to identify which of them are subject to removal. Merger of the two subsystems, wherever appropriate, has been recommended to ensure that civilian influence on the Armed Forces continues. This study suggests that this same merger is necessary to achieve a societal awareness of the need for military preparedness, and the opportunities for productive work in the military services, in order to achieve and maintain required military manning levels through voluntary hiring.

Schools Can Play Important Role

The school systems of the nation have several attributes that make it proper and advantageous for them to integrate information about Navy work into the substance of education. The most important of these involves the legitimacy of schools as sources of information. Most educators impart legitimacy and prestige to the subjects they discuss. Citizens assume that educators have prepared themselves well before they begin to teach, and have some expertise concerning all the subjects they present in school. Furthermore, it is an accepted goal of educators to teach only those lessons that have been examined very critically. (Such legitimacy is not attributed generally to many other sources of information, including recruiters.)

This aspect of legitimacy may be very important in increasing the accuracy of perceptions concerning the Navy. Research on the process by which images change indicates that prestige and trustworthiness of the source of new information tend to facilitate persuasion. Teachers probably are perceived as being more prestigious and trustworthy as sources of information than recruiters for the Navy or any other organization.

Secondly, the teacher in career education can truthfully adopt a position as a "neutral" communicator of career information rather than as a proponent of the interests of the Navy or any other group. This neutrality of source has been shown to increase learning and remembering of the information content of messages.[17]

Finally, teachers and counselors, in their ideal roles, are likely to explain all career opportunities in terms of both advantages and disadvantages. Such a two-sided presentation of Navy careers is likely to help students overcome *unfounded* criticism of the Navy which may reach them from a variety of other sources. Thus, a two-sided presentation of Navy opportunities may actually sustain accurate images of the Navy more effectively than a one-sided (positive) presentation.[18]

---

[17]Irving L. Janis and M. Brewster Smith, "Effects of Education and Persuasion on National and International Images," in *International Behavior*, ed. Herbert C. Kelman (New York: Holt Rinehart and Winston, 1965) pp 190-235.

[18]*Ibid.*

All three of these research findings are described in a long survey of the literature on attempts to induce changes in attitudes by persuasive communication. Again, the context in which the literature survey was performed was international relations, but if one accepts that the Navy, in terms of employment perceptions, has been separated from the rest of American work, the international model seems helpful. Other attributes which make schools a highly effective atmosphere in which new concepts can be introduced including the following.

- Professional Impact. It is likely that educators stimulate relatively intense learning experiences as a result of their expertise in the use of various techniques designed specifically for this purpose.

- Complexity. The combination of the duration of public school education and the professional impact enables the public schools to teach relatively complex subjects, including career decision-making.

- Early Access. The school setting gives children access to learning about a variety of phenomena to which their physical and social development might not otherwise expose them. A 12-year-old can read about or discuss microbiology or military affairs, for example, although he would normally not find it possible to participate in those fields at 12 years of age.

- Articulation. The public school curricula are designed to accomplish learning by introducing simple and general concepts and progressing methodically through lessons that are more complex and detailed.

- Breadth of Coverage. Since almost all young people in this country attend schools having curricula which conform with basic public school curricula standards, lessons which are topics of these school curricula are diffused widely throughout society.

Because of these attributes of schools, they tend to be a powerful force for disseminating information concerning any new subject or concept. Thus, the schools, more than any other institution in society, could expedite the integration of the military and nonmilitary components of society--even if the career education concepts did not exist. Again, the benefits of such integration, assuming that education concerning military affairs was not confounded by any normative bias, would probably go far beyond consideration of military enlistment and reenlistment rates only.

OVERVIEW OF CAREER EDUCATION APPROACH

The emergence of the career education concept makes the public school system an especially appropriate setting for education about the Navy. Career education adds another dimension to the advantageous characteristics of the schools, because it focuses on relationships of individuals and careers. Such a focus must include the Navy, which has over 500,000 uniformed employees and hires approximately 130,000 entry level employees each year.

While Section III of this report describes career education programs, a brief description of career education as it has been conceived by members of the education community is appropriate at this point.

The first point that must be stressed is that career education integrates academic and vocational curricula. Career educators argue that the historical separation of academic from vocational learning has often inhibited the proper personal development of students, and has disguised the relationship between learning and work. Integration of academic and vocational concepts, on the other hand, emphasizes that all truly substantive educational experiences develop the abilities of individuals to appreciate life and learning, *and* to contribute in some way to productive behavior of society--work--to the benefit of themselves and others.

In this context, academic studies are those which prepare a student indirectly or generally for a working life. Eventually, almost all students begin vocational studies to prepare themselves directly and specifically for work. Vocational learning in school can begin in the 10th grade, for students who have chosen careers that develop by early entry and extended on-the-job learning. For those who choose careers characterized by late entry and extended in-school learning, vocational learning may begin in a graduate school or in employer's training programs. Thus, in schools which adopt the career education approach, academic and vocational learning continues as before, but the purpose and value of all courses is more fully recognized, and academic and vocational concerns form an essential part of each student's educational program.

Career education, then, is simply *education* for *all* students. The "career" portion of the term was chosen in response to several observed needs of the education community and of society in general. First, educators perceive a need to develop the relationship between academic and vocational education, and to eliminate general education. Second, educators have a growing sense of urgency to make education relevant, and since students will eventually pursue careers, a career-oriented approach assures a perceptible degree of relevance for all education. Third, educators see the need for a coherent method of motivating students to learn. By emphasizing the usefulness of learning in career pursuit, educators hope to increase learning motivation. Finally, educators cite current patterns of school attendance, current unemployment figures, and future employment projections as indicating that changes in education practices are needed. These figures show that a large number of students who prepare for and enter college do not finish. Often they enter the labor market

without a marketable skill. Graduates of the general curriculum enter the force directly from high school. They, like the students who do not finish college, often cannot find employment in a market that demands skills. Moreover, Department of Labor estimates show that while the demand for skilled employees will continue to increase, the demand for college graduates will increase more slowly. On this basis, educators determined that a valid goal of education was the development of marketable work skills for all students through a career education program for all students.

Although career education has, in part, been described and practiced by educators over many years, current U.S. Commissioner of Education Sidney P. Marland gave the concept the impetus, exposure, prestige, and support of the U.S. Office of Education. While many educators have looked to Dr. Marland to define career education, he has not done so for a variety of reasons: Open discussion of the definition of career education will draw many educators into the process of developing the concept. As with other innovations, the concept of career education will be diffused only as rapidly as its potential practitioners are actively involved in it. Further, the diversity of local school systems throughout the nation makes definition at the federal level very difficult. Career education is a concept to be applied in response to individual local needs.

Dr. Marland has, instead, chosen to elaborate on the *objectives* of career education. In many addresses and articles, he and other USOE officials have discussed these objectives. For the purposes of this report, they may be reduced to a single clause: to prepare all students either to become properly, usefully employed immediately upon graduation from high school, or to go on to further formal education.[19]

Other educators have attempted definitions. Kenneth B. Hoyt and Rupert N. Evans provide contrasting definitions in a recent book.

> [Hoyt]...career education is defined as the total effort of public education and the community aimed at helping all individuals to become familiar with the values of a work-oriented society, to integrate these values into their personal value systems, and to implement these values into their lives in such a way that work becomes possible, meaningful and satisfying to each individual.

---

[19]Sidney P. Marland, "Career Education Now," an address to the 1971 Convention of the National Association of Secondary School Principals, January 23, 1971.

> [Evans]...career education is the total effort of the community to develop a personally satisfying succession of opportunities for service through work, paid or unpaid, extending throughout life.[20]

Each of these definitions demonstrates that career education involves a community effort, and that the individual student, his values, and his ability to achieve satisfaction through work are the foci of career education. Evans' use of the word "unpaid" implies that education is of value in work done in a leisure, self-development, or charitable context. His use of the word "succession" is very important because it reflects the position that a career does not necessarily consist of a single job which lasts a lifetime. Rather, a career is the sum of all productive activities undertaken by an individual during his or her life.

This definition of career, when applied to the military services, is even more important. "Military career" has often been used, both within the military services and without, to describe the work pattern only of persons who serve in a military branch for 20 years or more. Military supervisors sometimes tended to expect performance of lesser quality from persons who did not intend to pursue such extended careers in the military service. Some enlistees, quite reasonably, worked to a lower standard if they intended to exit the service after only one term. Other potential enlistees probably rejected military service because of the mistaken notion that career development opportunities existed in the military service only for those who were dedicated to serving at least 20 years.

The concept of career as it is developed in career education is intended to raise the quality of the work performed by all individuals to the level that is expected of careerists, regardless of the expected duration of their employment with a single employer. As career education achieves wider implementation in the public schools, the Navy and all other employers may be able to expect high quality work from all personnel, regardless of the length of their employment. Conversely, employees are likely to choose only those positions that provide career development opportunities very soon after entry.

Career Development Accompanies Self-Development

The entire career education concept is based upon the theory that vocational maturity can develop at the same time as, and in ways similar to, the development of each student's self-concept. Because these simultaneous patterns of development consist of a broadening awareness of self and the world of work, the U.S. Office of Education depicts the process of career education as the top of an inverted pyramid. This graphic representation is presented in Figure 2 to aid understanding of the following simplified discussion of activities which occur at various stages of each student's career education.

---

[20]Kenneth B. Hoyt, Rupert N. Evans, Edward F. Mackin and Garth L. Mangum, *Career Education: What It Is and How To Do It* (Salt Lake City, Utah: Olympus Publishing, 1972), p 1.

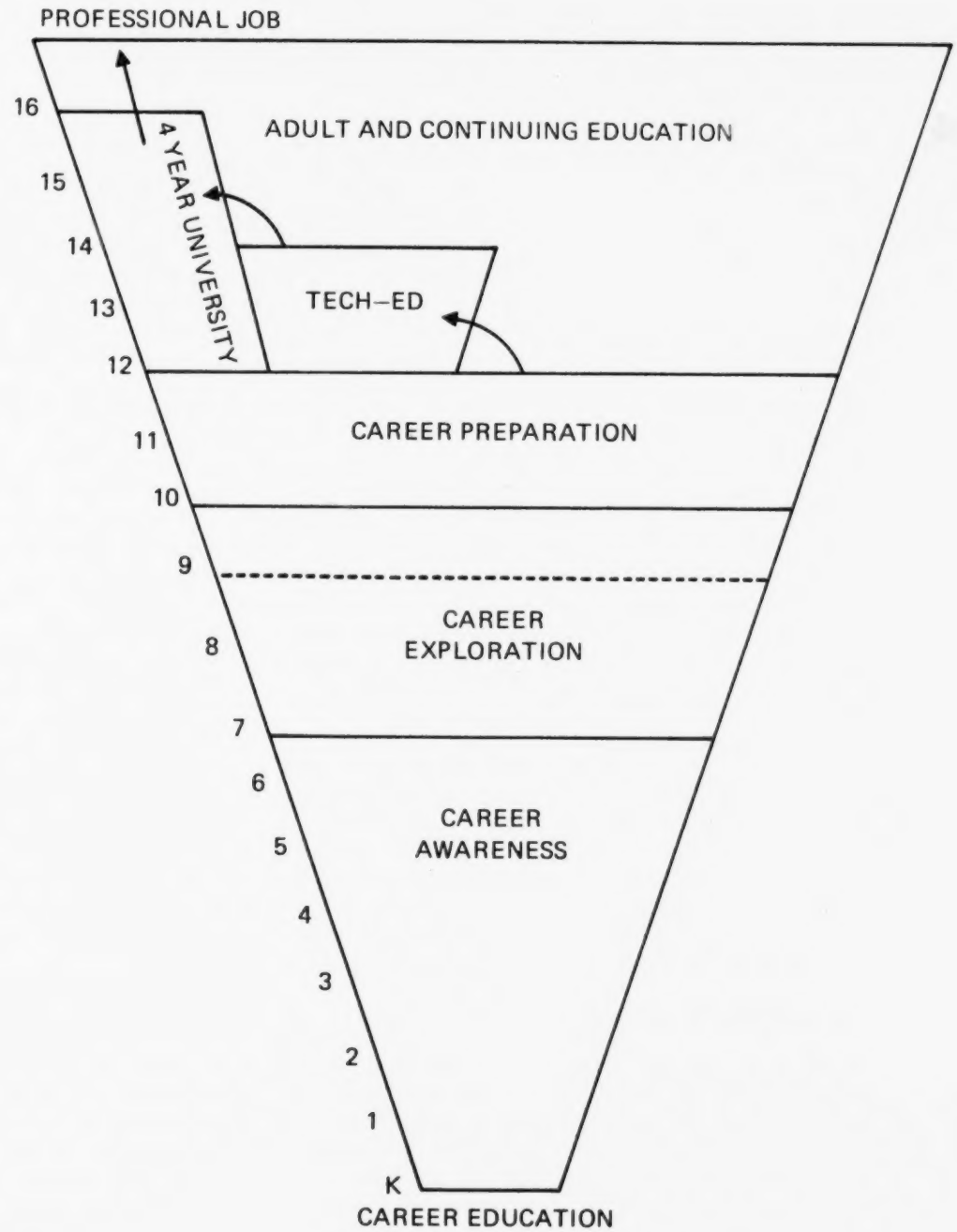


FIGURE 2. USOE REPRESENTATION OF BROADENING CAREER EDUCATION ACTIVITIES

Career Awareness Stage (Kindergarten-Grade 6)

At this stage, students will, as in the past, study basic elementary school subjects, but these subjects will be unified around a career development theme. Teachers can accomplish this unity of personal and career development in many ways, but only after certain background lessons about work are learned.

In the early grades, students will observe, through presentations in many media, that work has personal and social significance. Work will be viewed as a means of earning livelihood, a method of achieving self-satisfaction, and perhaps, as an opportunity for enjoyment. Work will be described in terms of its reflection of the interdependence of people in society and as a process of meeting human needs.

The immense variety of work, reflecting the diversity of human needs, will be presented to students in a number of "career clusters" or "work families." These are categories which represent general economic functions such as construction, manufacturing, and transportation. The sum of the work described in all categories is intended to represent the entire universe of work. At the career awareness stage, students will learn that all of these categories exist, and that they support, reinforce, and exert influence on each other. Students will also begin to identify some jobs which are included in each cluster. Selected career clustering systems are discussed fully in Section III of this report. Table 1 shows examples of how Navy ratings can be related to clusters developed by USOE.

When students have achieved a broad appreciation for the variety of work that is done, teachers can begin to infuse career significance into the teaching of every subject. A striking example is a fourth grade class in Fairfax County, Virginia, which set up a real manufacturing firm (piggy banks were produced) and simulated the management, administration and operations of a modern business. They used all of the activities of the "firm" as a context in which to study and apply English, arithmetic, art, and science. At the same time, they were experiencing, at some level, the pressures of decision-making and social interaction which accompany cooperative work toward an objective.

The factory experience described here is also an example of the use of student participation and simulation of work as learning exercises in career education. Much of the literature concerning career education stresses the probable utility of simulation as a means of integrating work into school activities. Simulation can be used by individual students as well. The military services have developed both group and individual simulations for many training programs. Some of these military training simulations could be used directly in public schools, as the Aerospace Education Foundation has shown. (See Section IV concerning the development of curriculum materials.)

TABLE 1

RELATIONSHIP OF USOE CAREER CLUSTERS
AND SELECTED NAVY RATINGS

Career Clusters	Examples of Ratings
Agri-business and Natural Resources	Petroleum Production Engineering Officer
Business and Office	Yeoman, Personnelman
Communication and Media	Radioman, Photographer's Mate
Construction	Utilitiesman, Equipment Operator
Consumer and Homemaking	Commissaryman, Dietician
Environment	Meteorological Equipment Officer
Fine Arts and Humanities	Language Officer, Musician
Health	Hospital Corpsman, Flight Nurse
Hospitality and Recreation	Special Services Officer
Manufacturing	Machinist's Mate, Production Engineering Officer
Marine Science	Naval Oceanographer
Marketing and Distribution	Storekeeper
Personal Services	Ship's Serviceman, Navy Exchange Officer
Public Service	Postal Clerk, Hull Maintenance Technician
Transportation	Quartermaster, Aviation Boatswain's Mate

Career Exploration Stage (Grades 7-10)

This stage builds upon career awareness and again unifies and focuses school subjects around a career development theme. This stage, however, emphasizes experience, including many activities outside of school, which the student can pursue individually or as a member of a group. Through a large number of such experiences, each related to school subjects as well as to career clusters, the student evaluates his own interests, abilities, values and needs in light of the career clusters he investigates. This evaluation process is intended to assist the student in making a tentative selection of one cluster (or several clusters) at the beginning of the 9th grade.[21]

The student subsequently studies his chosen cluster or clusters more intensively, again in relation to his school subjects. The goal here is to achieve an entry-level skill that will provide the basis for further progress. Although such entry level skill may not be achievable for each student in his chosen fields, the attempt to achieve entry level competence will, at least, assist students and counselors in selecting school subjects for grades 11 and 12. These subjects will be chosen based on whether the students wants (1) intensive job preparation to be used immediately upon high school graduation; (2) preparation for post-secondary education and training other than four-year college, or (3) preparation for a four-year (or longer) period of study in college.

Career Skill Preparation Stage (Grades 11 and 12)[22]

During this stage, the student works more intensively in his selected career cluster. Again, this work is designed to confront the student with the questions which arise in working, and thus to magnify the relevance of his school studies or other studies that can help to solve the problems encountered in work.

A subject that grows in importance during the Career Skill Preparation stage is *placement*. The student is supposed to receive more intensive guidance and counseling services relating to job placement at this stage. Such services, building upon the vocational maturity which the

---

[21]Some educators have divided the Exploration Stage into "orientation" (grades 7-8) and "exploration" (grades 9-10). The addition of "orientation" to the awareness, exploration and preparation stages described in this study does not contradict the reasoning underlying the tripartite model. Orientation seems to be that portion of exploration that precedes the tentative choice of a cluster for more intensive exploration.

[22]The career development theorists maintain that skill preparation extends many years beyond high school. Equating this stage with grades 11 and 12 therefore is an abstraction which serves only to emphasize the significance of the high school portion of the stage.

student has achieved since kindergarten, are intended to provide the student with increasingly detailed information about specific jobs and their requirements. Also, because of the vocational maturity of the students, counselors should be able to expose the students to a growing number of different jobs and preparation options.

Subsequently, the student and his counselor advance the placement process by continually refining the student's goals to match his interests and experience. The final step occurs when the student learns and takes specific actions to achieve placement with selected employers, post-secondary schools, four-year colleges or universities. Career educators also emphasize that a key activity which provides the background for this final step is the establishment of the strongest possible linkages of the public school systems with the post-secondary schools and colleges, and with employers.

The forcefulness of the career education concept, as implemented by the public schools, must decline somewhat for persons who have completed the 12th grade. The concept, however, is intended to invigorate education offerings for adults. As the career education approach is refined and popularized, programs of adult education are likely to employ more and more of the career education philosophy. Adult education, in public and private schools, colleges and universities may function more clearly as a method of achieving or updating skills which can be used in remunerative, charitable, or recreational work. Adult education may also play an increasingly important role in providing skills needed to make the transition between career fields or between career environments. USOE's Home/Community-Based Career Education Model, described in Section III of this report, provides an example of the career education approach applied to an adult population.

Emphasis on Community Involvement

Career educators are determined to utilize the resources of the community in the development of career education. They realize that the classroom environment is not always stimulating, and that learning, especially as regards work, might improve if students learned from workers at their places of work. Accordingly, career educators are discussing various methods of attracting noneducators to involvement in career education.

USOE's Employer-based Career Education Model, which is described in Section III of this report, is the most specifically articulated program of community involvement. Much more common than the employer-based education models, however, are new efforts of individual teachers and counselors to convince employers to speak at schools, to open their enterprises to field trips, to take selected student interns. In many ways, the education community is admitting that it knows too little about the "world of work," and educators are asking industry to help them learn--and help them teach.

Emphasis on Multimedia Approaches

Career education literature also urges the use of multimedia presentations, including motion pictures, film strips, slide-tape, video tape, cartoons. Field trips and internships (during grades 10-12) are also recommended. These materials and procedures amplify discussion and simulation in class, as do personal investigation and actual work experiences outside the school.

CAREER EDUCATION AND PERCEPTIONS OF THE NAVY

This discussion of career education suggests many opportunities which the public school systems can draw upon to familiarize students with Navy as well as civilian career environments. While Section IV of this report describes how school systems can integrate Navy careers into their programs, and how the Navy can initiate this process, it is useful at this point to conceptualize the role of the school systems in establishing a stronger linkage between the Navy and the nonmilitary portion of society.

Figure 3 depicts the concept of Navy-Career Education--that school systems, by achieving their own goals for career education, can serve to educate young people about career opportunities in the Navy environment. As will be noticed, the only differences between information flows depicted in Figure 3 and those shown in Figure 1 are that Navy information is transmitted by the *educators to the students* within the career education systems and that *all* Navy information channels reflect career education concepts as appropriate. The effects of this, given the attributes of the public school system, should be as follows:

- A greater understanding, among educators, of the Navy environment as an integral part of the world of work.
- An increased ability and willingness of educators to present the Navy environment for work to students in the same context as all other work environments are presented, and to assure that these presentations are accurate.
- An increased awareness and a more accurate perception among students of the career opportunities in the Navy. Discussions of employment opportunities with peers, since the majority of peers are either students or recent graduates, should include more and increasingly accurate information about the Navy.
- A decrease in the false differentiation between Navy service and work, and an increase in awareness of the special aspects of the Navy environment for work.

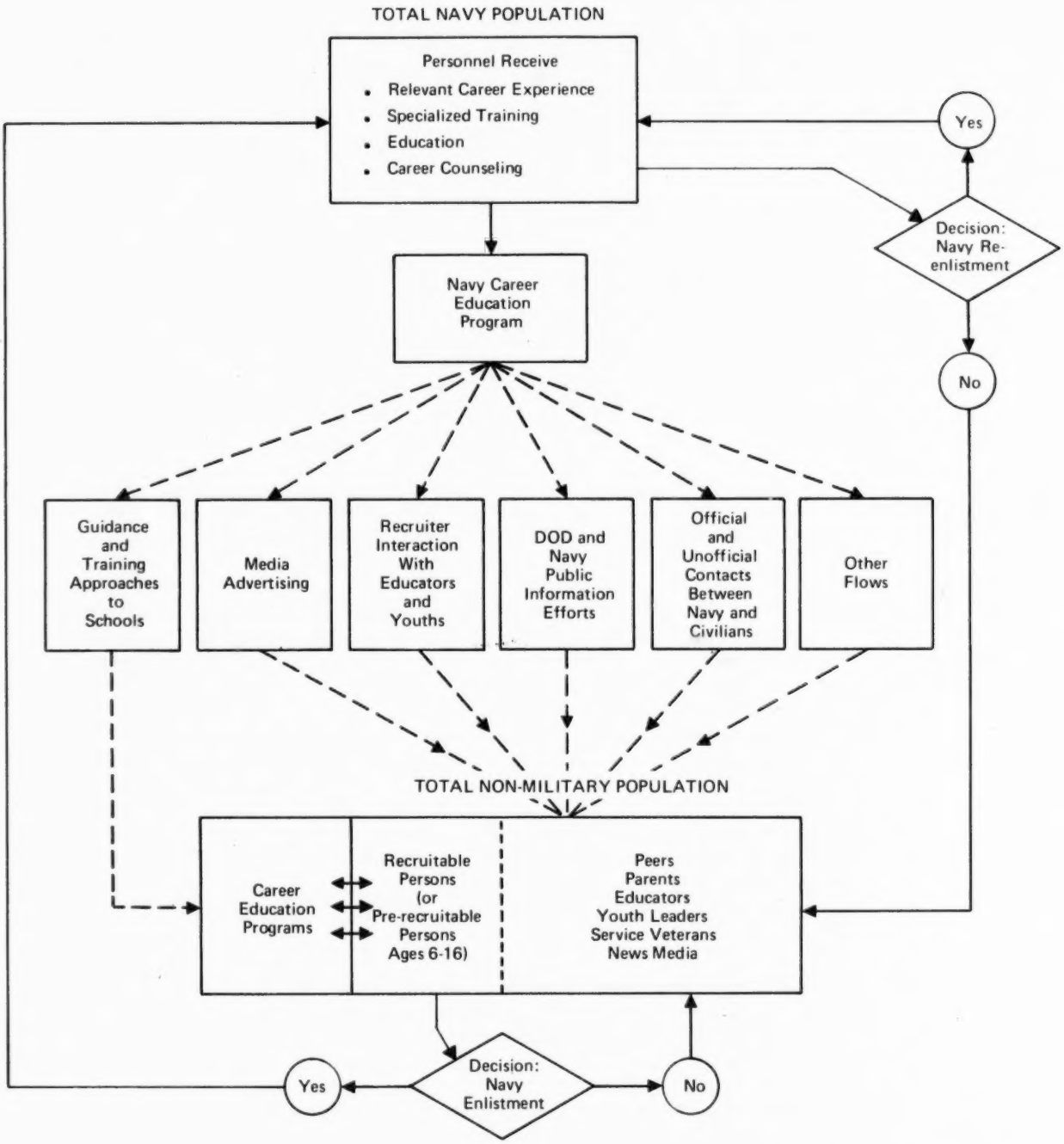


FIGURE 3. EFFECT OF CAREER EDUCATION ON INFORMATION FLOWS INFLUENCING NAVY ENLISTMENT AND REENLISTMENT

- With the passage of time, an increase in the number of recruitable persons who are aware of the Navy as an employer with a particular mission and environment which provides a wide range of opportunities for career pursuit.

The effects listed above can be described as direct in the sense that they occur within the nonmilitary environment among the persons to whom Navy information will be directed initially in the career education programs. Equally important are the secondary effects that result from the interaction of young people both with other members of nonmilitary society and with the Navy.

The dynamics of the diffusion of any change or new practice are, obviously, extremely complex. The series of presumed secondary changes in perceptions of the Navy described below, therefore, are not intended to represent specific actions, but rather the general results of many unspecified actions working in combination, both concurrently and consecutively. These general results, which stem from the simultaneous development of AVF and career education as innovations in American society, would probably take place without any Navy initiative, because of the dynamics of social behavior. That is, the naval defense posture of the nation would *demand* personnel; and the potential personnel, students in the career education system, would *demand* more information before enlisting voluntarily. Thus, it could well be that the Navy initiatives described in this report will only accelerate this process and make it more orderly.[23]

An analysis of the specific dynamics of this process is not appropriate to this study, but some of the results can be speculated or as follows:

- Students, other young people, and educators, when they become aware of the Navy as a career environment, should demand more information on Navy opportunities.

- Accordingly, the Navy should be able to communicate an increasing amount of information on Navy opportunities with greater assurance that this information will be used by the schools and other enterprises that provide employment information.

- An increase in the number of citizens who can weigh critically all information about the Navy. Dissonance in perceptions based on information coming from the Navy, parents, peers, printed and electronic media, Navy veterans, etc., will require resolution. This should result in citizens attempting to refine their own perceptions and demanding that any source that

---

[23]The process by which social changes of this type occur and by which they can be fostered are analyzed by Everett M. Rogers, *Diffusion of Innovations* (New York: Free Press of Glencoe, 1962).

provides information on the Navy achieve a high degree of accuracy.

- An increase in the percentage of citizens who, while rejecting Navy enlistment and reenlistment, do so with full and accurate knowledge of the advantages and disadvantages of the Navy to their careers.

- An increase in the quality of Navy enlistees, resulting from their selection of the Navy as an environment for career development rather than as a source of training, travel, or pay while marking time before undertaking a "real" career.

- An increase in the number of enlistees who attempt to improve efficiency and all other aspects of Navy work and Navy environment.

- An increase in the ability of the Navy to improve Navy work and Navy environment, and an increase in the necessity for such improvements to meet the demands of enlistees of higher quality.

- An acceleration of changes in the Navy that make it more productive and challenging, and more equally attractive as an employment opportunity. This attractiveness will then be communicated to society.

- An increase in the integration of the Navy into the entire society's perceptions of the total employment situation.

- An increase in efforts to find alternatives to military solutions of international conflict, and failing the discovery of such solutions, an increasingly mature understanding and appreciation of the nature of military organizations in United States society.

ORI cannot estimate how many of these changes will occur and how many people will be affected in a given time period. The school-related direct changes, however, can begin as rapidly as the Navy can integrate itself into career education programs. A review of these programs and suggestions as to how the Navy can be integrated into them comprise the remainder of this report.

CAREER EDUCATION RESEARCH AND DEVELOPMENT

III. CAREER EDUCATION RESEARCH AND DEVELOPMENT

BACKGROUND

The major thrust behind the current development of the career education concept and programs is at the federal level. Primarily because of the promotion of the concept by U.S. Commissioner of Education Sidney P. Marland, Jr., the U.S. Office of Education (USOE) became the focal point for funding of the research and development for career education. The current R&D program was initiated within USOE early in FY 1971. The approach to R&D was called "Directed Development." Contractors and grantees were funded to perform specific R&D projects within the overall parameters for design, development, and implementation established by USOE, and were closely supervised by USOE. The initial R&D program was a joint effort of the National Center for Educational Research and Development, and the Bureau of Adult, Vocational, and Technical Education.

In FY 1972, R&D efforts were placed under the Career Education Development Task Force, and were directed by a Special Assistant to the Deputy Commissioner for Development. In FY 1973, the Career Education Development Task Force was transferred to the newly-established National Institute of Education (NIE). It is this NIE task force that is currently monitoring the R&D for career education that is funded at the federal level.

From its inception, the R&D program for career education focused on determining the feasibility of providing career education through a variety of approaches, and on developing models of the basic approaches to career education that were identified. USOE determined that models should be independently developed for career education programs that were

- School-based
- Employer-based
- Home/community-based
- Rural residential.

MODEL I: THE SCHOOL-BASED MODEL

In June, 1971, a grant was awarded to the Center for Vocational and Technical Education (CVTE) of the Ohio State University for the development of the Comprehensive Career Education Model (CCEM), i.e., the school-based model. As stated in the Interim Report on this grant,[1] USOE outlined the following objectives for the CCEM:

- Restructure the entire Kindergarten-12 educational program around real life
- Integrate academic knowledge and skills with occupational training
- Assure that each exiting student will be prepared for further education or for entry into an occupation
- Provide a program relevant to each student and help him become a self-fulfilled, productive, and contributing citizen
- Incorporate community resources and nonschool educational opportunities into the program.

The concept of the school-based model was reflected in the "inverted pyramid" model which had been developed by USOE as part of the initial career education R&D program. For reference, this model is contained in Figure 2 in Section II of this report.

Based upon analysis of the USOE model, and a review of previous work in career education, career development, and human development, the CCEM staff developed a set of elements of a career education system for use in the project.[2] These elements were then verified in a series of meetings with consultants representing various educational specialties. Also developed were the "outcomes" or realistic learning goals for each career education element. The career education elements and outcomes developed for the CCEM are the following:

Elements	Outcomes
Career Awareness	Career Identity
Self-Awareness	Self-Identity

---

[1]"A Comprehensive Career Education Model, Interim Report," (The Ohio State University: Center for Vocational and Technical Education), March 2, 1972.

[2]Examples of the concepts underlying CCEM development are contained in, Keith Goldhammer, "A Careers Curriculum" a discussion draft report (The Ohio State University: Center for Vocational and Technical Education), December 1971.

Elements	Outcomes
Appreciations, Attitudes	Self-Social Fulfillment
Decision-Making Skills	Career Decisions
Economic Awareness	Economic Understanding
Beginning Competency	Employment Skills
Employability Skills	Career Placement
Educational Awareness	Educational Identity

These elements and outcomes reflect the overall goals for career education as a system, and as such form the basis for the operational definition of the CCEM. In order to develop the content of the school-based model, however, it was necessary to structure these elements and outcomes into a matrix reflecting the school years, kindergarten through grade 12, within the scope of the school-based model. Figure 4 presents the CCE Matrix as it appeared in the Progress Report for the project.[3] The CCE Matrix provided the framework in which individual career education goals could be developed for each grade level.

While the development of the school-based model was to be directed by the CVTE, the USOE project guidelines required implementation of the model in several selected school districts or local education agencies (LEAs) across the country, and participation of those LEAs in the model development process.

USOE outlined a six-step process for selection of the most appropriate LEAs for the project. The objective was the selection of a group of urban and semiurban school districts that were already advanced in their development of career education programs. Further, LEAs were to be selected in a manner such that the career education programs that would be developed within these LEAs could be readily transferred to other LEAs across the country.

After several rounds of proposals, site visits, briefings, and screenings by the CVTE and USOE, the sites selected for the school-based model development and pilot testing were:

- Atlanta, Georgia
- Hackensack, New Jersey
- Jefferson County, Colorado

---

[3]*The Comprehensive Career Education Model, Progress Report.* (The Ohio State University: Center for Vocational and Technical Education, July 1972), p 16.

C C E MATRIX
DEVELOPMENTAL PROGRAM GOALS

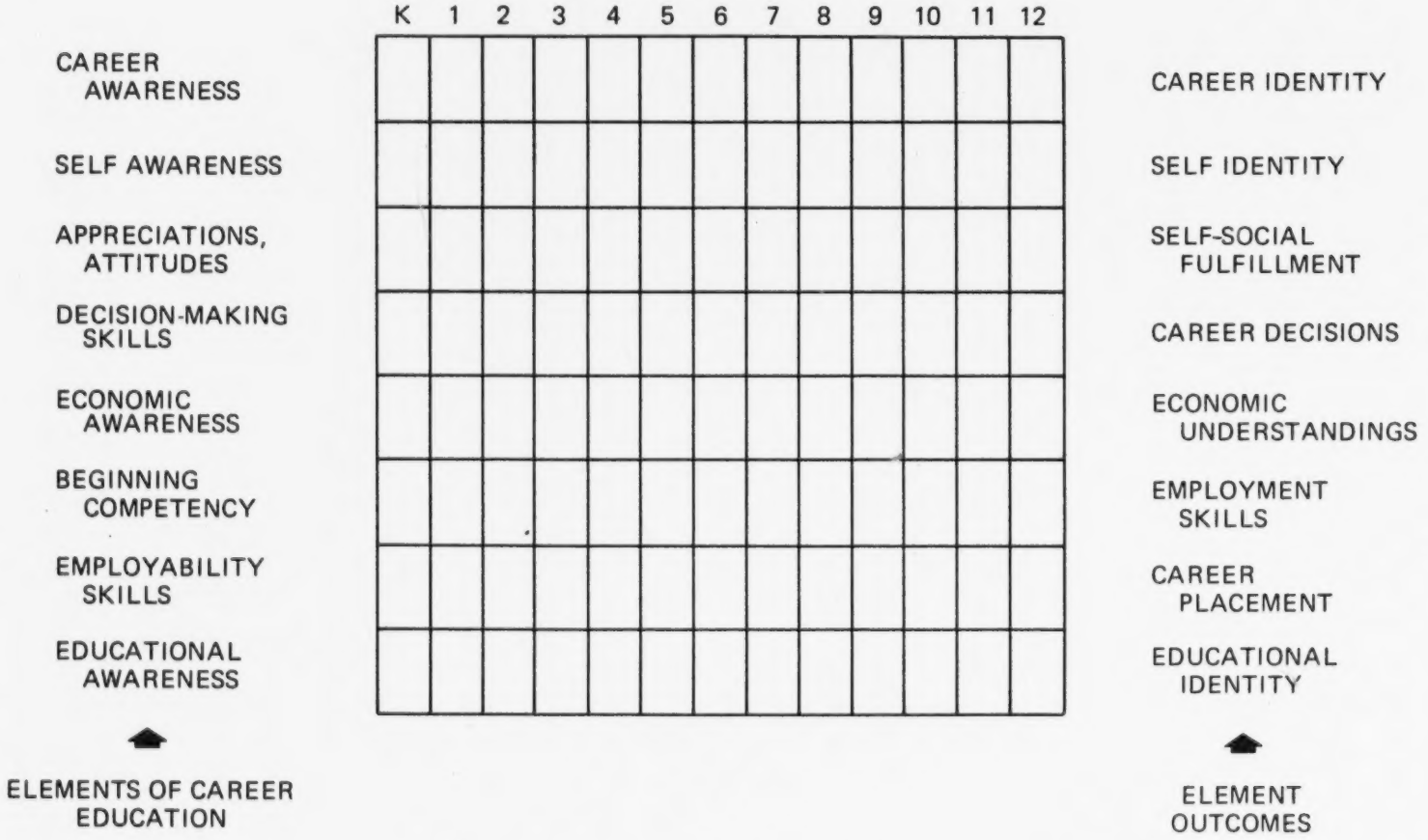


FIGURE 4. CCE MATRIX

- Los Angeles, California
- Mesa, Arizona
- Pontiac, Michigan.

Across these six LEAs, 114 elementary, junior, and senior high schools, 3,600 teachers, and 85,000 students are currently involved in the development and field testing of the CCEM.

Matrix Goal Development

Having established the matrix of CCEM elements and outcomes, the specific goals and performance objectives for career education students at each grade level were developed by CVTE staff in conjunction with teachers and administrators from the selected LEAs, and outside consultants. This team approach to development of goals and objectives was responsive to the need for involvement of the LEA personnel who would actually be implementing and testing the school-based model.

The eight major CCEM program elements previously described were expanded into 32 more definitive themes which extend across the K-12 grade levels. These themes were derived from approximately 1,500 goals and 3,000 performance objectives that were identified in a series of conferences and workshops involving CVTE and LEA development personnel. An example of a specific CCEM element and theme and related goals and performance objectives, is contained in Figure 5.[4] Given this level of specificity, career educators may select appropriate existing learning units, or develop new ones, to achieve learning goals at each grade level.

A modified Delphi approach was utilized in the matrix development. The detailed matrix of themes, goals and objectives generated during this Delphi exercise, while not believed to be ideal or final, nevertheless provides a structure for career education curriculum development, and a structure for understanding the grade-by-grade progression of students through career education goals. The matrix is intended to be refined by individual LEAs as they use it in development of individual programs.

Overview of K-12 Progression

Based upon working documents reviewed by ORI during a project visit to the Center for Vocational and Technical Education, overall milestones of the school-based model at each level of student progression may be summarized as follows:

---

[4]Aaron J. Miller, "Strategies for Implementing Career Education: A School-Based Model," paper prepared for the 1972 Annual Meeting of the American Educational Research Association (The Ohio State University: Center for Vocational and Technical Education).

ELEMENT Career Awareness GRADE 5

ELEMENT THEME NO. 14

ELEMENT THEME The student will understand that "career" involves progression through stages of preparation for and the performance of occupational roles and may involve a change in basic vocational direction.

GOAL STATEMENT	PERFORMANCE OBJECTIVE
B1.0 The student will recognize that some jobs have unique specific requirements for success.	B1.1 Given a list of skills required for success in some jobs, and a list of personal interests, skills, aptitudes, etc., the student will list in writing one or more examples of match or mismatch of job success requirements and individual variables.
	B1.2 Given instruction, the student will classify specific job requirements into job clusters on the basis of unique or similar requirements or types of requirements.
C1.0 The student will understand the relationships between present job experience and those of the future.	C1.1 Given a class interview with a worker, the student will compare the things that the class is studying with the skills the worker had to learn before he could perform his job and thus understand the relationship of present experiences to future goals.
	C1.2 Given a list of jobs and school activities, the student will match jobs with school activities necessary for the job and understand their relationships.
D1.0 The student will apply basic responsibilities and performance standards for any job in general vocational situations.	D1.1 Given instruction, the student will list acceptable behavior when applying for a job and role play to illustrate this behavior.
	D1.2 Given a list of behaviors, the student will be able to classify those always acceptable and those sometimes acceptable.
	D1.3 Given the opportunity to observe one occupation, the student will be able to describe four specific duties of that worker.

FIGURE 5. EXAMPLE OF CCEM ELEMENT

- Kindergarten--Successful transition from home to school for students; introduction to basic concepts of work and workers

- Grades 1, 2, 3--Expansion of concept of work and workers; introduction of two occupational clusters (goods and services) as a way to introduce occupations in general

- Grades 4, 5--Further expansion of concept of work and workers; expansion of occupational clusters to five (industry, commerce, social science, services, art)

- Grade 6--Synthesis of student career development experiences to date to facilitate transition to grade 7; selection of occupational clusters of interest, using curriculum units, group guidance units, small group and individual counseling

- Grade 7--Review of tentative career preferences; planning for grade 8 course selection, including selection of career clusters for exploration and other elective courses

- Grade 8--Update of tentative career preferences; projection of tentative four-year education plan in light of career development experiences to date; determination of specific career exploration or preparation approach for grade 9

- Grade 9--Refining of career preferences and education plan based upon synthesis of career development and planning to date; introduction of additional information on key career education matrix themes

- Grade 10--Review of career education plans; modification of program as needed for final two years of senior high school

- Grade 11--Completion of preliminary planning for job entry or post-secondary education program

- Grade 12--Completion of planning and action related to job placement or post-secondary education.

Development of Units

While the matrix structure of career education goals and objectives provides the foundation for the school-based model, it is the curriculum or treatment units that are used to impart career education to students in the classroom. The overall objective of the school-based model development is the development of career education learning units that are transferable or transportable to other schools across the country, pending their full development and testing in the pilot schools. Because of the critical importance of selecting units that meet career education goals at all levels in the matrix, for broad application across the country, an intensive screening and selection process was employed by the CCEM project staff. Based upon a national search for suitable learning units, and a review of existing units in the selected LEAs involved in the CCEM development, approximately 1,000 candidate units were identified. Through several iterations of a review process, the units to be developed were reduced to a set of approximately 140. These units were organized by grade level into three groups (K-6, 7-9, and 10-12) for development and pilot testing in the selected LEAs.

Because of the importance of transportability to other schools, the school-based model units are developed in a standard format. The basic components of a career education unit are the following:

- Teacher's guide, containing rationale and use of the unit, goals and performance objectives of the unit
- Teaching procedures, including learning activities, resources (such as slides, tapes, films, etc.), student performance evaluation criteria and procedures
- Curriculum materials used in teaching unit
- Procedures to evaluate the unit in operation
- Specifications for inservice training of teachers and others implementing the unit.

Other Components of Model

In addition to the career education curriculum units which comprise the core of the school-based model, several support functions that relate directly to the effectiveness of the career education school-based model are being developed as part of the CCEM project.

CCEM Career Information System. The manner in which occupations are organized and described for presentation to career education students is critically important to the success of the school-based approach to career education. A model of a Career Information System (CIS) is therefore being developed by the CCEM project staff along with the career education units. The CIS is designed to present occupational information in a manner that facilitates its integration into the curriculum, and provides material

for use in career guidance and counseling of students as well.[5] The system is designed to present a flow of information from general career areas to specific occupations, paralleling the general-to-specific flow of the kindergarten through grade 12 career education program overall.

The system is intended to provide an information base comprised of all (21,471) occupations contained in the Dictionary of Occupational Titles (DOT). Information on occupations is organized into a three-dimensional structure that illustrates (1) what work is done (the product of work), (2) how work is done (the process), and (3) what kind of worker does the job (characteristics of the person). Because of geographic variability, the system will not include socioeconomic information on occupations. As the student progresses from kindergarten to grade 12, the information he receives becomes more complex. At the K-3 level, all occupations are related to either goods or services. At the 4-6 level, occupations are related to industry, social science, commerce, art, or service. At the 7-9 level, occupations are broken down to the level of the first two digits of the DOT code (83 categories). At the 10-12 level, the 229 industry titles of the DOT are used to present the occupations.

The system will essentially take the form of a card deck, with descriptive information structured, as previously described, on the card front, and job preparation requirements on the card back.

Community Relations. Because the success of the career education approach is so closely linked to involvement of the community in the programs, the school-based model development includes the development of a plan for community involvement. While current development work is focusing on involvement of the communities in which the six selected pilot LEAs are located, a community relations plan must be a component of the school-based model wherever it is transported and implemented in the future.

Community relations include such elements as parental involvement, relationships with local industries, community organizations, and the mass media. The plan must inform the local community of the presence, purpose, and progress of the career education programs, as well as involve all resources of the community in the development and conduct of the programs. Films, brochures, and briefings are currently seen as mechanisms to involve the community in the programs.

Guidance. In the traditional education system, the guidance counselor is the focal point for career information, individual and group career counseling, and personal counseling as well. With the integration of

---

[5]As explained to ORI by Mr. Walter Adams, the research and development specialist responsible for the CIS. The CIS model is described in detail in a paper prepared for the Sixth Annual National Vocational and Technical Teacher Education Seminar. Walter W. Adams, "Career Information System for the Comprehensive Career Education Model," (The Ohio State University: Center for Vocational and Technical Education), 1972.

career information and academic and vocational subjects within the career education concept, the role of the guidance counselor becomes an even more critical one. The guidance program within career education must be closely coordinated with the career education curriculum in order to support the students through information and counseling appropriate to each grade level in the career education program.

The guidance program that is being developed as part of the CCEM project is based on the goals stated at each level of the career education matrix, as previously described. It is also being coordinated with the curriculum units that have been selected for development within the school-based model. The guidance program will be comprised of units that will be used in conjunction with the appropriate curriculum units.

A current experiment in the guidance programs involves the infusion of three guidance units into curriculum units at the grades 9-12 level. In this test, teachers presenting the curriculum in classrooms will also function as guidance counselors, with help from the regular school counselors.

Placement. A job placement system that is capable of placing every student who wants placement is viewed as a realistic goal by the CCEM project. This implies a placement system capability of 100% placement though the probability of every student exiting a career education program wanting job placement is low. Even so, the obvious importance of job placement capability to schools offering career education will require a concerted job development effort on the part of guidance and placement, personnel supporting the career education programs.

The prototype placement system now being developed will provide for placement in jobs, additional education, or special services wanted or needed by exiting students. Job placement will include full-time and part-time jobs, on-the-job training (OJT), apprenticeship programs, and other employment opportunities. Education placement will include post-secondary programs in technical institutes, trade schools and junior and senior colleges. Special service placement will include vocational rehabilitation, workshops, counseling and therapy programs, and other services that may be required.

The prototype system is being developed in two phases:

- Phase I. The first phase is a transition system that is intended for use in schools where students have not yet been exposed to career education units. The system is being designed for both minimum staff and ideal staff conditions.

- Phase II. This phase is a comprehensive system, and intended for use in schools where students have been exposed to career education units. This phase is being designed for ideal staff conditions. The first priority of this system will be placement for exiting

students, but placement of students who are still in school (part-time jobs for experience and money) will be included.

Current Development

While the preceding paragraphs describe the school-based career education model in terms of objectives and major components, the current status of development of the major components of the model of greatest interest to the Navy is summarized as follows.[6]

- Curriculum units--98 units are currently being field tested in the six pilot LEAs. Testing will continue through June, 1973. These units will be evaluated by NIE's Career Education Development Task Force. Units will either require further modification, or will be designated ready for implementation. The balance of the total (approximately 140) units will be field tested pending completion of this first field test.

- Career Information System--The system is being developed by CCEM project staff. At the K-3 level, approximately 130 of a total of 200 pieces of information on jobs have been developed and are currently being printed. At the 4-6 level, approximately 25 of a total of 380 pieces of information have been developed. Development of occupational information for the system at the 7-12 level is not now underway as funds for this have not been granted by NIE.

- Guidance--A matrix of guidance units (corresponding to the career education curriculum units) has been developed by the pilot LEA in Los Angeles, California. Thirty guidance units are being developed by a contractor to the pilot LEA in Mesa, Arizona. Additional guidance units are being developed by the pilot LEA in Atlanta, Georgia. All of these units are scheduled for completion in early spring, 1973.

- Placement--The K-12 prototype placement system is being developed by the pilot LEA in Jefferson County, Colorado. The target date for completion of this system is June, 1973.

---

[6]ORI has kept current with CCEM development, primarily through members of NIE's Career Education Development Task Force (Mr. Thomas Israel, Deputy Director, and Dr. David Hampson, coordinator for CCEM development), and through Dr. Aaron J. Miller, Associate Director for Field Services and Special Projects, CVTE, OSU.

CCEM project staff groups are continuing to develop the additional components of the school-based model at this time. These include the evaluation system, the in-service staff training system, and the community relations system. All of these components are being developed and tested in the six pilot LEAs at this time, and will become components of the transportable school-based model upon its completion.

MODEL II: THE EMPLOYER-BASED MODEL

The employer-based career education model is an alternative to the traditional education environment for secondary school students. The employer-based model is intended to provide an optional out-of-school program for any student who chooses it. The model is open to all students, including those who have experienced adjustment and motivation problems in the traditional, structured classroom setting, as well as those who simply want a new or additional educational experience.

The objective of this model is to personalize the educational experience for each student by defining key learning elements in academic and vocational curricula, and then locating opportunities to learn these elements in work situations and in related individual and group activities. The model will expose students to a complete curriculum, and will allow each student to participate in structuring his own program. This includes both the academic program and the program of work and related activity. The model will meet all requirements for high school graduation. It will provide a valid diploma for students remaining in employer-based programs until graduation, or it will provide fully accreditated courses transferable to local public high schools for students who choose to reenter the traditional system. The predominant feature of the model is that it will operate outside of the traditional school-based education system, providing students with a variety of work experiences which they may select for themselves.

Development and Organization

The Regional Education Laboratories, funded by the USOE, are responsible for development of the prototype employer-based models. Feasibility studies of the model concept were initiated by the Research for Better Schools Laboratory in Philadelphia, Pennsylvania, and the Far West Laboratory in Berkeley, California in June, 1971. In addition, the Center for Urban Education in New York City worked under contract to USOE, analyzing other career education programs for components potentially useful to the employer-based model.[7] Following the feasibility analysis of the concept, development of the operational models in the four locales was initiated.

---

[7]The potential and the problems of the employer-based concept are discussed by a member of the Center for Urban Education in "Employer-Based Career Education: A New Alternative," *The Urban Review*, March 1972.

The educational laboratories responsibile for developing and pilot-testing the models are the following:

- Research for Better Schools, Inc.
  Philadelphia, Pennsylvania

- Far West Laboratory for Educational Research and Development
  Berkeley, California

- Northwest Regional Education Laboratory
  Portland, Oregon

- Appalachia Educational Laboratory, Inc.
  Charleston, West Virginia.

Each employer-based model is operated by a consortium of employers representing both public and private sectors, under the sponsorship of a laboratory. Each consortium is established as a legal entity. Members of consortia represent all elements of the employment community, including business, industrial, professional organizations. As with the school-based model previously described, the employer-based model development is aimed at production of a model that is transferrable and transportable to locales across the country for their implementation and operation.

Program Structure

Because the model is employer-based, the bulk of student learning experience occurs on employer sites. The experience that students realize with each employer will vary, of course, depending upon the nature of the employment setting, and depending upon the type of program that is designed and developed by the employer in conjunction with the laboratory. Student experience may range from short-term observation of a variety of work activities of interest, to long-term hands-on experience in specialized occupations.

In addition to experience on employer sites, students also receive the formal education skills they require through a learning center or central resource center in the community. This center is the focal point of each student's program, in that it provides a central location for coordination and direction of individual programs and is established outside both the local public school system and the employer sites. The center must meet all licensing and accreditation requirements for secondary schools, and so must provide a comprehensive secondary education program. The focus of much of the development activity for the employer-based model has been on the instruction program for each model location. Instruction must be designed to supplement the learning situations provided by employers, and must be designed to allow sufficient flexibility to accommodate individual student program needs. The mix between employer and resource center experience can vary with each employer. For example, some employers provide the academic courses needed by students on their own sites.

Research for Better Schools (RBS) Program

The employer-based model being developed and operated in Philadelphia, Pennsylvania, provides an example of the structure of a comprehensive employer-based program.[8] The approach taken by RBS involved the establishment of the Academy for Career Education, a private, nonprofit corporation, in January 1972. While RBS maintains overall responsibility for development and operation during the first two years, the Academy Board, currently comprised of employers, educators, and representatives from labor and the community, will set policy direction for the Academy, and will eventually take over operational responsibility.

RBS is organized into two basic components of activity:

- Program development is aimed at development of a full range of model elements, including learning settings, instructional programs and materials, teaching staff, resource personnel, evaluation mechanisms, and R&D activities. The program development component is subdivided into (1) general education systems, (2) student personnel systems, (3) employer systems.

- Program operations is aimed at recruitment and orientation of program employers, work with employers in definition of their roles in program, coordination of all employers and groups involved, establishment of Academy facility, selection of (approximately 100) students, and implementation of prototype programs for students selected. The program operations component is subdivided into the same three systems areas as the program development component.

The RBS employer-based model, itself, is subdivided into three basic functional areas: instruction, student personnel, and evaluation.

Instruction. While some instruction will be provided at the central Academy facility during the first year of operation (beginning October 1972), most instruction, perhaps all instruction, may be provided at employer sites in the future. The instructional program consists of the following three areas of education.

General Education. This covers the content of traditional secondary school education in the following areas:

- o Basic education provides cognitive, affective, and psychomotor skills

---

[8]Program is discussed in detail in "Employer-Based Career Education, A Background and Briefing Report" (RBS, Inc., Career Education Program, 1700 Market Street, Philadelphia, Pennsylvania, July 12, 1972).

- Extended education provides core curriculum of natural and social sciences, humanities, arts

- Supplementary education provides a variety of courses beyond the core curriculum.

Explorative Education. This involves on-site study of work and life situations as follows:

- Career exploration provides a perspective on the economic and business system, including analysis of jobs and careers within and among employer clusters

- Life skills exploration includes such areas as managing a career, relating to others, home and family, community rights and responsibilities.

Specialized Education. This involves hands-on experience with jobs and projects in the following two categories:

- Career specialization provides specific work experience, both short-term and long-term, managed by employers

- Life skill specialization involves intensive examination of individual and community problems, in conjunction with public service agencies.

Student Personnel. The student personnel system supports the instructional programs and the individual student's programs and activities. The system consists of four areas of service.

Admission and Records. This service includes activities which facilitate flow of students into the program, and from the program into employment and additional education.

- Program publicity creates awareness of the Academy in the community

- Selection and admission involves screening student candidates at appropriate grade levels and in appropriate numbers to meet program capacity

- Student records include records required by law for a private school, records needed for students transition to public schools, colleges, employers, and administrative records.

Assessment. The following assessment data will be applied to individual student program planning to ensure that any necessary treatment is arranged, and to ensure that student programs are responsive to individual needs:

- Medical/dental
- Psychomotor
- Social
- Psychological
- Education.

Counseling. Counseling serves to identify individual student's needs--educational, vocational, social, personal--and respond to them in a supportive manner. Counseling includes the following services:

- Orientation includes description of the Academy, the employers' roles, and program planning for each student
- Appraisal of student progress and decision-making affecting that progress is made based upon a data base for each student
- Information services include maintenance of a continuously updated base of educational and vocational information
- Program placement involves matching student interests and needs to education alternatives in the Academy
- Program monitoring, evaluation, feedback, and final placement are on-going activities within the model.

Student Activities. Student activities are important in a program of this nature where students are dispersed throughout a city. Bringing students together for peer group socialization and institutional identification is required for an effective program. Dr. Lance Hodes, Program Manager for Model II at NIE, explained that this should be one of the key functions accomplished at a central resource center. Activities range across social, recreational, organizational, inter- and intra-mural, and contact functions.[9]

Evaluation. Types of evaluation required for both the development and operation of the employer-based model include the following:

- Evaluation of student learning progress in program. This evaluation is handled as part of the student assessment function, as previously discussed.

---

[9]Interview with ORI staff members.

- Evaluation of project performance, i.e., project capability to meet objectives. This is being performed by an external evaluator to the RBS project.

- Evaluation of program development process, i.e., impact of the program on students, staff, community.

This third type of evaluation is probably most critical to the model itself, in that it focuses on each of the components of the educational program (student characteristics upon entry, changes in knowledge and behavior during program, and program elements affecting student knowledge and behavior) and analyzes program goals in these components in terms of both process and product. Instruments used in performing this evaluation will be developed during the initial model development project, for use on an ongoing basis or at prescribed intervals during model operation.

Current Development

While the preceding paragraphs describe the employer-based career education model in terms of objectives and major components, the current status of development of the four initial model programs is summarized as follows:

- Research for Better Schools, Inc. (RBS)--The program admitted approximately 100 11th grade students in October 1972. All of the components of the program developed to date focus on grade 11. The program will operate with these students through August 1973. Following this, the program will expand to grades 10 and 12. During this second year of operation, approximately 200-250 students will be admitted.
  RBS program is focusing on detailed program development and testing. Detailed documentation of model for purposes of model replication elsewhere is not being requested by NIE at this time. Such documentation will probably be requested at end of second and third years of development.

- Appalachia Educational Laboratory, Inc. (AEL). First year development contract for AEL program will produce operating manuals for use in replicating model elsewhere. This first contract is scheduled for completion by end of FY73. The AEL model has focused on a program of instruction and a program to involve employers in model. While the instructional program is not as well developed as that of RBS, the employer involvement program is well developed and has been successful. The AEL model is officially linked to the public school system, but is a separate program.

The AEL program focusing on grade 12 has currently approximately 25 students with whom it is field testing the instructional program. During the next contract (FY74), an additional 25 students will be admitted at the 11th grade level. The program for grade 11 will be tested with these students. The program for grade 12 will then be operational, in that field testing will have been completed.

- Far West Laboratory. The Far West model focuses on highly individualized instructional programs for students, developing "experience trails" for each student. It is an urban model, with the learning center located in Oakland, California. Far West will turn over operation of the model to a consortium of six major employers by February 1973, and will continue to provide technical assistance to the consortium through August 1973.

  Far West currently enrolls 22 students, and will expand to 50-75 students by June 1973. Documentation of the Far West model, for purposes of replication, should be available by December 1973. Development and operation of this model beyond August 1973 will depend upon the ability of the consortium to arrange funding for the model.

- Northwest Regional Education Laboratory. The Northwest model is suburban in nature, and currently enrolls approximately 15 students at the 11th and 12th grade levels. The learning center is located in a suburban shopping center, providing an education program in areas of basic communication, occupations, science, and problem solving. Ten "learning managers" on the project staff have developed learning packages at 80 employer sites. The employers are heavily involved in the operation of the model at this time.

  The Northwest Laboratory has established the model as a nonprofit corporation, under the direction of a citizen advisory board. This board will assure responsibility for operations in approximately 2 years.

  The Northwest model will enroll 50-75 students by June 1973, and 200-300 students during the following school year. Documentation of the model for replication elsewhere will be available in August 1973.

MODEL III: THE HOME/COMMUNITY-BASED MODEL

The Home/Community-Based Model is aimed at a target population of adult men and women who are not employed or actively seeking employment, or engaged in full-time education. This target population is essentially "home-based"; comprised of retired persons who would like to work, housewives planning for future work outside the home, younger people (16-25 years of age) who are "in and out" of school and have no career direction, among others.

The objective of the model is to prepare this home-based population to select and pursue a promising career. This model differs from the other models in that it does not provide instructional programs directly to a target population. Rather, it utilizes a variety of public channels of communication, as well as a resource center, to provide information and services pertaining to career education.

In June 1971, the U.S. Office of Education contracted the design and development of Model III to the Education Development Center, Newton, Massachusetts. The Center is a nonprofit corporation. The site chosen for the demonstration and testing of the model is Providence, Rhode Island.

Career Education Approach

The design of the model incorporates the standard career education concepts in general (i.e., career awareness, exploration, preparation) but articulates them in a slightly different way to fit the adult target population. Career education elements in this model are the following.

- Career Exploration. This involves exposure to a variety of occupations and professions. The model focuses not only on what jobs involve, but also on what future employment prospects exist for these jobs. Because of the importance of accurate information on employment prospects in the area served by the model, and in the state and country overall, a "promising career cluster" concept has been developed. Based upon analyses of the most recent Manpower Report of the President, Bureau of Labor Statistics projections, and State Employment Security projections, the model presents occupational information in the context of data on current and future job availability.

- Career Planning. This includes analysis of personal career goals in terms of actions required in meeting those goals.

- Career Preparation. This includes acquisition of education and training required to meet career goals. Education and training ranges from higher education, to high school equivalency, to adult basic education. For some individuals, brush-up courses in their previous occupational fields may be prescribed.

Components of Model

As described by NIE, the central theme of Model III is the orchestration of the mass media and existing career education resources in the community in order to reach and respond to the career education needs of the home-based population in the community. Mechanisms which are employed by the model are the following.

- Telephone Information and Counseling Service. A service called "The Phone Number" is being widely promoted in the Providence area. Community residents are being made aware of this number, and are being advised to call to discuss personal career interests and abilities, and obtain information on how a career could be planned, and how needed services could be obtained. Information provided by telephone counselors includes:

  - promising occupational, professional, and community service opportunities in the immediate area, and nationwide

  - career-related education and training programs available in the area

  - support services such as testing, child care, and financial aid available in the area.

  The Phone Number can refer individuals to education and training institutions, and provides follow-up and liaison between the institution and the individual referred. Telephone couselors will always return calls, where time is required to search for information needed by a caller.

- Mass Media. This involves the development and presentation of career education information through television and radio programs presented by the model project. In addition to these, printed and audio-visual materials are being produced and distributed (e.g., mailed) by the project.

- Resource Center. This facility houses films, books, tapes, and other materials describing careers and career preparation. It is used to present displays of career information and public events such as discussions, conferences, institutes, workshops, etc., concerning careers and career education for adults. According to Ms. Juliet Brudney, director of the model project in Providence, the Resource Center is the focal point for promotion of career education in the community, and is used to support all other model activities.

In addition to the model services, the model project works closely with the education and training institutions and the service agencies in the area, to coordinate their services to the population within the context of career education, and to provide information and technical assistance to them in the development of their career education offerings. This is done in conjunction with the Rhode Island State Department of Education.

Current Development

Model III development and pilot operation is continuing through 1 March 1973 under an extension of the original U.S. Office of Education contract. The Education Development Center is proposing to continue development and operation for an additional 3-year period. The continuation will focus project efforts on the research design for the model, as well as cost effectiveness analysis and program budgeting for operations. The final 2 years of the project will include documentation of the model for purposes of replication elsewhere.

The Phone Number and the Resource Center are currently operational, and the mass media is being employed to inform community residents of the project, and bring them into the Center. One career education information kit has been printed, and will be distributed to the target population through direct mail, institutional distribution, etc. Film segments for use in television programming are currently being developed.

MODEL IV: THE RURAL RESIDENTIAL MODEL

The Rural Residential Career Education Model differs from the other models in a number of obvious ways. First, it is family oriented, focusing on service to a family unit rather than an individual student or adult. Second, it is aimed at a disadvantaged target population. Third, it is residential, involving families in a total learning environment and living experience. Fourth, it is regional, drawing families from the rural areas of Idaho, Montana, Wyoming, North Dakota, South Dakota, and Nebraska, and as such, contributing to the economic development of the six-state region.

Because of these features, the model is clearly a research and development effort. It is designed to demonstrate that through the provision of an intensified career education program in a residential setting, the economic and social conditions of disadvantaged families can be improved. An important component of the model is job development and placement for the working members of each family participating in the model.

The model is being developed under contract to the Mountain-Plains Education and Economic Development Program, Inc. Model development is planned for a 5-year period. The first year (recently ended) was organizational in nature. The full documentation of the model, for purposes of replication elsewhere, will be produced over the balance of the 5-year period.

The residential center is located at Glasgow Air Force Base, Montana (an active SAC base). The model is designed to serve 200 families at any one time. Furnished two and three bedroom duplex houses are rented ($40.00 per month) to families on base, and a full range of community facilities (store, shops, club, theater, gymnasium, etc.) is available to families. Public services (elementary school, hospital, post office, library, fire protection) and religious services are also available.

Families receive $75.00 per week for participation in the model. Fathers (heads of households) work 40 hours per week in the program, and mothers participate 20 hours per week in activities to improve homemaking skills, or learn job skills if desired. Children over 16 years of age also participate in work situations in addition to school attendance.

Time in attendance at the residential center varies for each family, based upon unique family needs. This may range from 3 months to 1.5 years, but the average time in attendance should be 9-12 months.

Components of Model

The Rural Residential Career Education Model is comprised of two basic types of activity; the provision of career education leading to employability of family members, and the provision of family life services.

Education Program. The model is designed to provide preparation in the occupational areas of tourism, health, and public services. The instructional program is organized into six core subjects: business and office, mobility and transportation, food services, facilities management, facilities operation, and educational and social services. The interest of the program is to provide family members with skills that are applicable to a variety of jobs in each of the three overall occupational areas.

The instructional program is presented in the context of the three standard "phases" of career education, as follows:

- Career Awareness. This includes exposure to requirements and responsibilities of a broad range of jobs, and analysis of individual abilities relative to these jobs.

- Career Exploration. This includes selection of a tentative career preference based upon exposure to career clusters, groups and families, and analysis of individual situations.

- Career Preparation. This includes development of skills and attitudes needed to obtain employment in the selected career area, adjust to the working environment, and advance in the selected career area. Occupational skills are taught at 200 learning stations at the center, and at 75 job stations in the surrounding community.

Family Life Services. The Family Life Services department assists each family throughout the program at the residential center. Three major services are provided.

- Counseling. This service is intended to coordinate all program activities for the family as a unit.
- Recreation. These activities are intended to promote constructive use of leisure time for the family unit.
- Home Services. These services include money management, sewing, home care, home planning, meal planning, health education, physical fitness, etc.

Current Development

The model is in its second year of development. One hundred and sixty-eight families are currently in residence at the Glasgow Air Force Base model site. The 200-family residence total will be reached in the immediate future.

Dr. Harold Johnson, NIE coordinator of Model IV development in Denver, Colorado, stated that the career awareness and career exploration phases of the education program have been developed and installed at the center, and the career preparation phase is being formalized at this time. The learning and job stations are operational, but the formal documented learning packages to be used in the education program are not yet complete. Eighty of the packages are currently being tested by the model prior to documentation. The family life program is also being developed at this time.

Model staff recently surveyed approximately 50 employers in the six-state region to determine potential job availability for model graduates. Results of survey indicated good placement potential. Analysis of other family residential programs in country is now underway, as is a cost-benefit analysis of the model.

EXEMPLARY AND RESEARCH AND DEVELOPMENT PROJECTS

Under Parts C and D of the Vocational Education Amendments of 1968, (Public Law 90-576), the U.S. Office of Education has funded 111 exemplary and research and development projects in career education. In accordance with the law, these projects are distributed throughout the nation with at least one exemplary project and one research and development project in each state and the District of Columbia, for a total of 103 (Minnesota has 3 projects). The remaining eight projects are operating in Puerto Rico, the Virgin Islands, Gaum and American Samoa, and the Trust Territory of the Pacific Islands.

Information on these projects was provided to ORI by Dr. Sidney High, Chief of the Program Development and Operations Branch, Division of Vocational and Technical Education, Bureau of Adult, Vocational, and Technical Education, USOE.

These projects are currently in various stages of development. Some have been completed as originally conceived. Others continue through 1973, 1974, and 1975. As career education materials are produced by these projects, they are included in *Abstracts of Instructional Materials in Vocational and Technical Education*, a publication of the Educational Resources Information Center (ERIC).

The specific features of these projects are intentionally diverse, for they are designed to fit the needs of the local communities in which they are progressing. In general terms, however, they conform to the concept of career education as previously described in this report.

Summary and Analysis of Projects

ORI reviewed abstracts of the exemplary and research and development projects in order to present to the Navy some general statements about their content. Table 2 presents the basic thrusts of the projects, each of which is more complex than can be adequately described either in a verbal abstract or in the matrix presented here. By counting the number of projects which have a general focus on instructional materials, occupational exposure, or staff training, and linking each of these components to the career education stage to which they pertain, an overall impression of the focus of current career education development is provided. It should be emphasized that these are federally sponsored developments, and do not include projects being initiated and funded at the state and local levels.

TABLE 2

EXEMPLARY AND RESEARCH AND DEVELOPMENT PROJECTS IN CAREER EDUCATION BY PROJECT EMPHASIS AND STAGE AT WHICH DEVELOPED

Career Education Stages	Instructional Materials Development		Occupational Materials Activities & Development		Staff Training	
Career Awareness Stage K-6 (or Elementary Component)	Part C	32	Part C	33	Part C	28
	Part D	20	Part D	22	Part D	7
	Total	52	Total	55	Total	35
Career Exploration Stage 7-10 (Junior High or Middle School Components)	Part C	16	Part C	51	Part C	21
	Part D	15	Part D	42	Part D	5
	Total	31	Total	93	Total	26
Career Skill Preparation Stage 11-12 and beyond (Senior High and Post-Secondary Components)	Part C	9	Part C	52	Part C	15
	Part D	11	Part D	45	Part D	5
	Total	20	Total	97	Total	20

The following definitions will aid in understanding the categories that ORI has used to describe the projects.

- Instructional Materials Development consists only of specified efforts to infuse occupational information and work significance into the teaching of subject matter in various disciplines in the classroom.

- Occupational Materials and Activities Development consists only of specified attempts to improve or expand guidance, counseling, occupational information dissemination, work experience, cooperative education, field trips, and placement. Activity is focused on work directly rather than on the presentation of classroom subject matter.

- Staff Training consists only of specified activities provided for the preparation of teachers, counselors, and administrators in subjects related to career education.

These definitions are derived from the descriptions of all 111 projects. Since they are arbitrary, it must be pointed out that they are never discrete one from another. The dynamics of the school situation and educators' awareness of the need for system-wide development of career education assure that all career education projects have given some attention to all stages and to each component. The nature of the school systems demands that each project develop instructional materials, occupational exposure programs, and staff training. Therefore, the definitions and the matrix below reflect only the specified *emphases* which project directors have attributed to their own projects.

Examination of the matrix reveals that most of the projects emphasize greater occupational exposure for all students. Older students (career skill preparation stage), because the schools will soon lose influence with them, are the focus of 97 of the occupational exposure efforts. By similar reasoning, the career exploration stage has received almost as much attention, since occupational guidance during those years is essential to preparing students for critical decisions concerning the career skill preparation stage.

The next level of emphasis is placed on the career awareness stage, in the development of both the instructional materials and occupational exposure materials and activities. This represents the source of long-range development for the total career education program.

Staff training and instructional materials, although apparently not of primary interest currently, will undoubtedly grow in the future. As the techniques of career education instruction are refined, diffused, and become more understandable, the tempo of instructional materials development will quicken. The availability of a cadre of career educators to train staff will also grow by the same process, and the demand for, and funding of, staff training will increase.

Review of the exemplary and research and development projects also serves to illustrate the variety of techniques that are employed in the programs.

Overview of Project Activity

Although the abstracts of the projects are not uniformly enumerative, and, therefore, do not justify any attempt at estimating the frequency with which the techniques are used, the following listing of activities reflects the diversity of the projects.

- Canvass of employers to establish a file of full-time and part-time jobs available
- Increased usage of aptitude, ability, interest, and awareness tests
- Workshops, academic courses, and inservice training sessions to train staff in career education concepts
- Teaching to achieve specified behavioral objectives, and pre- and post-testing to assess achievement of objective criteria
- Field trips to specific firms, or through an entire geographical region, to observe work, life styles, social environment
- Simulation of the use of school subject matter in the work of persons in specific occupations
- Simulation and other techniques to train students in decision-making, with focus on career decision-making
- Individualized instruction through open classrooms, modular scheduling, and other techniques
- Establishment of a career information center for all students in a school
- Use of time-shared computer terminals by students to obtain career information
- Use of audio-visual materials including video-tape cassettes, tape-slide, slide, film strip, microfiche, tape, motion picture and closed-circuit television presentations
- Simulation of actual business structures and activities (such as a bank) within the classroom setting, to stimulate learning of both computational and language skills, and to develop career awareness and work values

- Completion of actual or simulated job applications and job interviews, to stimulate learning of language skills and factors and values desired by employers
- Class visits, presentations, and instruction by community members who represent occupations, career clusters, and firms
- Use of role-playing to stimulate learning about occupations
- Expanded use and activity of community advisory councils to support career education
- Use of packages or kits by individual students to stimulate learning about an entire occupation and to develop subject matter skills
- Use of mobile career information centers and mobile career exploration centers to give more students hands-on experiences with machinery and other equipment
- Use of computers to analyze student characteristics relative to work
- Computerized matching of students with available jobs
- Enlistment of craftsman "big brothers" to sponsor individual drop out prone trainees
- Appointment of teacher and counselor committees in a single school or a single school system to act as change agents in the innovation of career education
- Expansion of coordination with Model Cities programs and with U.S. Department of Labor training programs
- Alternatives for scheduling choices to enable students to work in paid employment
- Expansion of outreach to parents and to dropouts in the community
- Tutorial programs, both youth-to-youth, and adult-to-youth
- Multi-lingual guidance and counseling
- Summer programs expansion

- Enlistment of minority group role models to visit schools or open their business activities to minority group student observation

- Increased coordination between high schools and post-secondary schools and employers

- Close coordination of career education activities with those of teacher training institutions

- Enlistment of skilled craftsmen as part-time instructors

- Team teaching to integrate guidance, skill development and vocational maturity development activities

Other Career Education Programs in Schools

Another survey of career education projects, many of which were undertaken without direct federal support, was accomplished by Palo Alto Educational Systems of Scottsdale, Arizona.[10] The following abstracts from the report of the survey provide an overall view of the progress of career education. At this point in time, the Palo Alto Educational System's report is the best available evaluation of career education programs. They contend that their single most significant conclusion is that

> ...there is an unusually high level of interest in career education within public schools and state departments of education throughout the country. Many of the organizations surveyed already had developed concepts of career education that generally are complementary to the program effort of the Center. Specifically, it is generally recognized that career education is a total program spanning grade levels K through 12 and not merely an extension of traditional vocational education concepts and programs.

The report summarizes the four basic approaches to career education programs that were discovered in the survey:

- [Units] introduced through essentially a guidance and counseling procedure involving direct contact with students by trained personnel and inservice training of classroom teachers.

---

[10]Palo Alto Educational Systems, Inc. *A First Step Toward Career Education*, Vol I (The Ohio State University: Center for Vocational and Technical Education), 1972, pp 31, ff.

- [Teaching units] which provide to classroom teachers career goals and objectives and resource materials to promote expansion of existing curriculum components to include career education concepts.

- Rewrites of curriculum for specific subject areas at either a single or multiple grade level to incorporate and emphasize career education requirements.

- Enrichment units developed to meet specific program objectives over a short duration that require a limited amount of instructional time for presentation.

Materials that were assessed during the course of the project cover all grade levels and span the bulk of career education elements established by the Center. A limited number of skills training materials were obtained because of the project emphasis which was described earlier. Finally, viewing the materials that were assessed in the light of traditional curriculum components, *mathematics and science are areas of study in which the least amount of career education material is available.* [ORI's emphasis.]

The report also stated that of the materials and programs reviewed, which the report refers to as "treatment units," those of greatest value were those that had been encouraged by special federal and state funding. "Only on rare occasions," wrote the authors, "did we find individual school systems developing sound career education programs within their own resources."

Career Education Programs Outside the Schools

The Bureau of Adult, Vocational and Technical Education, USOE, has sponsored at least one program of career education development which occurs entirely outside the school setting. This is the Career Awareness for 3 to 6-year-olds Project of Sutherland Learning Associates, Los Angeles, California. This project consists of infusing career development presentations into animated and real-life filmed segments of "Captain Kangaroo," a nationally televised program with a vast audience of pre-school children.

The "Captain Kangaroo" career awareness effort focuses primarily on the development of the social and emotional maturity of children relative to work and work values, and the growth in children's awareness of the interdependence of workers in the economic system. The presentations of the career awareness filmed segments are to commence on the "Captain Kangaroo" program in late February 1973.

At a later time, Sutherland Learning Associates will market packages of the filmed materials with supportive printed materials.

EXAMPLE OF STATE LEVEL DEVELOPMENT

Career education at the state level, developed by a State Education Agency (SEA), differs from other career education developments, primarily in terms of its scope. An SEA is concerned about career education statewide, and is concerned about a comprehensive and coordinated approach to development, implementation, and operation of career education across all types of institutions.

The State of Oregon is recognized as one of the most progressive states in terms of career education development.[11] Since 1964, the Oregon Board of Education had been developing the concept of career clusters to support vocational education programs in the state. This development was clearly applicable to the new career education concept, and provided a foundation for career education development in the state.[12]

The Oregon approach to career education is consistent with standard career education school progression.

- Career awareness at the elementary level
- Career exploration at the junior high level
- Career preparation at the senior high level.

To this progression is added:

- Specialized training at the community college level.

Development funds are being applied to all of these levels at this time, but it is at the secondary school level that Oregon has apparently progressed the furthest in conceptualization and development. The role of an SEA in career education is to guide and support development and improvement of programs throughout the state. Oregon has prepared a number of guides to aid schools in this effort. In one of these guides, the major components of career education development to be addressed by schools are the following:

- Career cluster curriculum
- Occupational education

---

[11]ORI was referred to the Oregon program by Dr. Otto Legg, Deputy Director, Division of Vocational and Technical Education (DVTE), BAVTE, USOE.

[12]The Oregon program was described to ORI by Mr. Monty Multanen, Coordinator, Career Program Operations, Career Education Section, Oregon Board of Education.

- Articulation of secondary and community college programs
- Special needs programs
- Cooperative work experience.[13]

Career Cluster Curriculum

The development of career clusters in Oregon began in 1964, and took into consideration requirements for clusters, representative of the range of jobs available in the state, that contained jobs that employed, and would continue to employ, significant numbers of people, and that would provide valid foundations for development of curricula. Twelve tentative clusters were identified by career education specialists. While research and development is continuing on several additional career clusters, the following are the original clusters used in Oregon:

- Agriculture
- Food services
- Health
- Accounting-Bookkeeping
- Clerical
- Steno-Secretarial
- Basic marketing
- Construction
- Electricity-Electronics
- Industrial mechanics
- Metals
- Wood products.[14]

A curriculum for use in grades 11 and 12 has been developed for each cluster. The objectives of each curriculum are to aid student development in the following areas:

---

[13]Oregon Board of Education, "Guide to Career Education Development in Oregon," Tentative Draft, Salem, Oregon, July 1971.

[14]These clusters are discussed in greater depth in Occupational Clustering Systems, later in this section.

- Understanding of the employment opportunities available in a broad career area, knowledge of the preparation needed to enter and make progress in an occupation within the broad career area

- Necessary skills and knowledges, including proper work habits and attitudes toward work, that pertain to the occupational area

- Appreciation of the importance of the industry or industries that comprise the career area

- Effective health and safety practices needed in the occupational area

- Understanding of labor laws and regulations

- Ability to communicate effectively

- Skill in the application of job seeking techniques

- Effective human relations skills, including personal and social skills, as they relate to employer-employee and interpersonal relationships

- Understanding of the psychological and political aspects of career areas that are pertinent to the occupational, social, and civic responsibilities of individuals to each other and to their communities.

Each cluster curriculum contains the following elements:

- Listing of key occupations contained in the cluster, including appropriate Dictionary of Occupational Titles references and manpower demand data

- Student learning objective specific to the cluster curriculum

- Graphic portrayal of suggested curriculum pattern, i.e., all courses and experiences which relate to the career cluster

- Descriptions of occupational speciality courses and subject matter constituting the basic curriculum, as well as courses supporting the basic curriculum.

Occupational Education

Oregon career education provides for occupational education for students beginning in grade 7 and continuing through grade 12. While the career cluster curricula, described in the preceding paragraphs, provide occupational education in grades 11 and 12, grades 7 through 10 focus on provision of occupational exploration experiences and information to students. Career guidance counseling, of course, is provided at each grade level throughout the secondary school program. Guidance is provided on an individual student basis, and is also provided in occupational information courses as part of the career cluster curricula.

The *Guide to Career Education Development in Oregon* suggests an approach to occupational exploration in grades 7 through 10 that is based on analyses of behavioral outcomes for all students. The approach involves analysis of each career education concept in terms of desired student behavior, development of activities or experiences which will aid in achieving those outcomes, and determination of the career cluster curriculum to which each activity or experience relates. Typical examples include the following:

- Behavior: Awareness of need for better qualified craftsmen and technicians.

  Activity: Study of changes occurring in industry and jobs; relating job changes and training requirements; discussing this on individual and group basis.

  Clusters: All.

- Behavior: Understanding of changing position of agriculture in nation's economy.

  Activity: Comparison of population involved in food production today with population involved 25, 50, and 100 years ago.

  Clusters: Agriculture, food services, marketing.

- Behavior: Accurate record keeping.

  Activity: Use of simulated materials for processing, recording, filing of checks, receipts, bills, letters.

  Clusters: Clerical, stenographic, accounting, agriculture.

Articulation of Secondary and Community College Programs

The Oregon approach to career education states that occupational education at the secondary school level is designed to meet the job preparation needs of large numbers of students, and is intended to complement programs of advanced and continuing occupational education and training,

while occupational education at the community college level is designed for individuals who have graduated or dropped out of high school, and individuals who need upgrading or retraining. Secondary programs focus on provision of skills and knowledge common to jobs in an occupational cluster, while community college programs are more specialized.

In this context, articulation refers to the process of transfer from one educational level to another. Oregon believes that effective articulation between its secondary schools and its 13 community colleges is important to the success of career education in the state. To aid in the smooth transition of students from secondary to post-secondary programs, current high school cluster curriculums have been aligned with typical community college programs of specialization. The following are brief selected examples of this alignment.

- Mechanical curriculum in high school aligns with
  - Aircraft design and drafting
  - Industrial technology
  - Office machines technology
  - Others
- General clerical curriculum in high school aligns with
  - Instructional materials technology
  - Data processing
  - Sales clerk
  - Others
- Building construction curriculum in high school aligns with
  - Surveying
  - Civil engineering technology
  - Building maintenance
  - Others.

Special Needs Programs

The Oregon approach to career education focuses on the special needs of students who are disadvantaged and handicapped. The goal is to enable these students to assume a position of independence in our economy, and to provide them with career education, to the extent possible, in "regular" programs that are sensitive to their special needs, as opposed to programs that separate them from the mainstream programs in the schools.

To meet this goal, programs in Oregon are being designed to serve students in the following categories:

- Special academic needs--Low-level ability in reading, spelling, vocabulary and math.
- Special economic needs--Nutritional and health problems, inadequate finances for school attendance.
- Special social needs--Problems with English language, antisocial behavior; conflicts with the law.
- Handicapped--Hard of hearing, deaf, speech impaired, visually handicapped, blind, seriously emotionally disturbed, mentally retarded, physically handicapped.

Guidelines for special programs to meet these needs have been provided to schools by the Oregon Board of Education.

Work Experience

An integral component of Oregon's overall occupational education program is student work experience. Work experience programs provide employment for students that is supervised by the school and linked to the students' school programs. Supervised work experience enables students to relate academic and vocational courses to the work environment. Because of the diversity of needs among students, and because of the variations in extent to which occupational education programs benefit from work experience components, three types of programs, each initiated and controlled by secondary schools, have been developed.

- Exploratory work experience education--essentially a guidance program, where students spend school time at jobs within the school or at establishments outside the school. Students are not responsible for substantial amounts of production work, but rather focus on the nature of the occupations involved, and on their own suitability for those occupations. Some school credit is given for time spent on the job.

- General work experience education--this program is intended to provide students with maturing experiences and some income. Part-time work provided to students is not necessarily related to their specific occupational programs and goals, and related instruction takes place on the job.

- Cooperative work experience education--this involves employment of students in jobs directly related to their occupational education programs. Employment may serve only as a laboratory, or may provide the bulk of training for an occupation. Students receive both school credit and pay, and may spend up to half of their school time on the job.

Work experience programs are present at the community college level as well. Here the emphasis is on mastery of specific skills, as opposed to exposure to a number of jobs in an occupational area.

Variations of work experience programs include the following:

- Diversified occupations programs that combine occupational instruction and cooperative work experience in a variety of jobs into a single class, where school size or number of occupational programs in a school is limited.

- Extended education involves use of public and private community agencies to provide educational experiences, where they can do so more appropriately or more economically than the school district.

- Work-study programs provide part-time employment for students who need the income to continue their full-time education.

EXAMPLE OF DEVELOPMENT AT LOCAL LEVEL

The success of career education nationwide is very much dependent on the success of individual Local Education Agencies (LEAs) in developing and implementing programs fitted to their own unique systems and needs. While career education development is occurring in numerous LEAs across the country at this time, one of the most successful efforts is currently underway in Anne Arundel County, Maryland.[15] The goals of the Anne Arundel

---

[15]ORI was referred to Anne Arundel County by Dr. Sidney High, Chief, Exemplary Programs and Services Branch, DVTE, BAVTE, USOE. Dr. High cited the Anne Arundel County effort as a good example of an exemplary career education program.

County program are the following:[16]

- To provide programs that will equip students with an occupational skill for job entry, if they so desire, when they complete their 13 years of schooling
- To prepare students for our changing technological society by developing intellectual skills and the ability to analyze a problem and make decisions so that they will be able to adapt to changes in their lives and in their occupations
- To develop in students the proper attitudes and behaviors that will enable them to obtain and hold a job and succeed in career advancement.

Program Structure

The Anne Arundel program is structured around five concepts which relate to students and their orientation to the world of work, as follows:

- Self--self-understanding is vital to career decisions and work performances
- Society--society reflects the creative force of work
- Technology--man and technology are continually interacting in his work
- Economics--man's livelihood depends upon the production, distribution, and consumption of goods and services
- Career--career education prepares now for the world of work.

Each of these concepts is broken down into a number of more detailed subconcepts (a total of 39 across the five areas). For each subconcept, behavioral objectives for students have been developed. These behavioral objectives are essentially the desired outcomes of program activities under each of the subconcepts.

The career education curriculum is based upon all of these behavioral objectives. The program itself is organized on four levels of instruction:

---

[16]Program goals and additional general descriptive information are contained in "Career Development Task Force," an unpublished report available from the Public Schools of Anne Arundel County.

- Level I Primary grades (K-2)
- Level II Grades 3-5
- Level III Grades 6-8
- Level IV Grades 9-12.

In Levels I and II, students should develop self-awareness and career awareness; in Level III, students should begin to focus on career preferences, and select perhaps three career clusters of interest; in Level IV, students should focus on one cluster of interest, begin getting "hands-on" experience with specific job preferences, and receive basic skill training as required by job preferences.

Each behavioral objective is addressed in the curriculum, with few exceptions, at each of the four levels. For example, under the concept of career, one of the subconcepts states that "transferable knowledge will facilitate retraining." Behavioral objectives for this subconcept are the following:

- Level I--The student will demonstrate that simple manual and intellectual skills learned in the performance of a work task can be applied to other work tasks
- Level II--The student will support, by example, ways in which general attitudinal, intellectual, and manual skills used in various occupational areas are transferable in the accomplishment of a variety of jobs
- Level III--The student will illustrate ways in which specific skills and knowledge may be transferred to facilitate retraining
- Level IV--The student will interpret occupational trends and evaluate his transferable skills and knowledge that will facilitate retraining.

Program Activities

Based upon the detailed behavioral objectives developed for each subconcept at each level in the school system, a detailed set of student activities has been developed. These activities are designed to achieve each behavioral objective, and each activity is performed in the context of one of the basic subject matter areas in which the student is involved. These subjects, and the acronyms used in the curriculum are as follows:

- Social Studies (SS)
- Language Arts (LA)

- Mathematics (Math)
- Science
- Music
- Art
- Physical Education (PE)
- Home Economics (HE)
- Industrial Arts (IA)
- Distributive Education (DE)
- Business Education (BE)

By linking activities to subjects, career education is infused into the classrooms in which the subjects are being taught. This represents a straightforward approach to relating classroom subjects to the world of work.

The activities are contained in four career development curriculum design manuals, one for each level in the school. Figure 6, two pages taken from a curriculum design manual currently in use in the school system, provides an example of how student activities relate to subjects, behavioral objectives, subconcepts, and program levels.[17]

Instructional Materials

To support career education in the classroom, the Anne Arundel program provides Teachers' Instructional Packages for use by teachers as part of the career education curriculum. These packages are designed to aid teachers in the infusion of career education into the subjects being taught. The packages are keyed to the appropriate career education concept, subconcept, behavioral objective, and subject area. Each package represents a unique learning unit, the subject of which serves as the vehicle to present the career education material. Typical units are:

- Interdependency of workers in Maryland
- You in the world of work and play
- Contribution of workers
- Occupations from hobbies

---

[17] *Career Development, Level III*, Public Schools of Anne Arundel County, August 1971, pp 93-94.

ACTIVITIES Level: III (6-8)

Concept:	Society
Subconcept:	The customs, traditions and attitudes of society affect the world of work.
B.O.:	The student will analyze how the customs, traditions, and attitudes of society affect jobs in broad occupational areas.

Area	
S.S.	After researching several broad occupational areas, the studen's will report their findings concerning the differences and similarities in customs, traditions and attitudes in these areas.
S.S.	Student will conduct a survey to determine peoples' attitudes about jobs in various broad occupational areas.
S.S.	The student will discuss the entry of women into such fields as mail carriers, engineers, jockeys and state their opinions on the laws which say there can be no discrimination on account of sex.
L.A.	Given titles of jobs in several broad occupational areas, the students will write editorials in which they discuss the impact of customs, traditions and attitudes on these jobs.
Science	The student will study the organic farming and food trends currently in vogue and will contrast and compare them with traditional inorganic methods.
Science	The student will analyze the effect of and trends in drug usage in the home, in farming, in industry, in medicine and in social situations.
Music	The student will illustrate how the development of Rock n' Roll music has affected the formation of performing groups and created jobs in the music industry (e.g., formation of rock bands, demand for electric guitar, drum, amplifiers, etc.).

H.E.	Role playing situations, the student will represent the women of past, present, and future times and emphasize the changing role of women in work.
I.A.	The student will research and report on how customs, attitudes and traditions affect the skilled trades. In interpreting their findings they will answer the following questions: Why is there a shortage of skilled craftsmen? Why can craftsman demand such high wages? What effect does the upward mobility of lower classes have on trades? What is the educational system's attitude toward trades?
I.A. L.A. H.E.	Using the theme of styles in clothes for the girls and cars for the boys, the student will discuss how society's customs, traditions, and attitudes have affected jobs in these occupational areas.

FIGURE 6. PAGES FROM AN ANNE ARUNDEL COUNTY CURRICULUM DESIGN MANUAL

- Understanding yourself
- Attitudes and behavior.

Units specify the idea, skill, and/or attitude to be developed, the major components of the unit to be presented, specific learning objectives, equipment and materials needed, special facilities required, instructions and materials to pre-test and post-test students on the unit.

In addition to the curriculum design manuals and the learning units, a variety of resource materials is employed in the presentation of career education in the classroom. To support the individual learning units, printed and audio-visual materials, most of which are commercially produced, are used to present specific occupations, subjects, etc. These materials are relied upon heavily to supplement the learning units. According to Robert Jervis, Coordinator, Career Education Implementation Team, career education materials developed by the Navy would be welcomed as resource materials, and would be infused into the appropriate learning units.

Current Development

During the 1971-72 school year, career education materials were pilot tested in two secondary and four elementary schools in Anne Arundel county. During the 1972-73 school year, materials are being tested in 4 secondary and 14 elementary schools. Plans are to implement career education in half of the total 18 secondary and 76 elementary schools in the country during 1973-74; 75% of the schools during 1974-75; all of the schools during 1975-76.

R&D and implementation is being handled by the Career Education Implementation team, composed of a coordinator and six resource specialists, who identify and develop new materials and assist teachers in implementation. Approximately 150 learning units are in various stages of development at this time. Most development is being conducted in workshops at Bowie (Maryland) State College, in conjunction with the adjoining Prince Georges' County, Maryland, Public Schools.

Robert Jervis, Coordinator of the Career Education Implementation Team, indicated that development efforts must concentrate on the basic skill training phase of career education. Schools are able to develop career awareness and self-concept understanding, but have difficulty in providing skill training, primarily because of costs involved in maintaining up-to-date equipment on which students are trained. Mr. Jervis is attempting to involve community resources in the program, i.e., enlisting cooperation of local organizations that could make their equipment available to the school program.

EXAMPLE OF UNIVERSITY DEVELOPMENT

The Career Development for Children Project (CDCP), according to Dr. Larry Bailey, Principal Investigator for the project at Southern Illinois University, is "designed to involve children, beginning in elementary school, in experiences which will facilitate the broad goal of 'vocational maturity'." The project, based upon self-concept and career development theories, is producing an elementary school career development model and curriculum materials which will "allow the student to gain adequate knowledge about himself and the world of work, and adequate experience in relating the two to make intelligent career related decisions."

Program Structure

The project, funded by the Illinois Board of Vocational Education and Rehabilitation, developed a framework for grades 1 to 8 which is divided into three stages:

The Awareness Stage (Grades 1-3)--At this stage the students learn at three levels. First they become aware that day-to-day activities, including work and play, are purposeful, and they learn to identify and classify *some of the reasons* for human activity. Next, the students, with the natural tendency to fantasize about occupations, broaden their understanding of work and play and of classifying activities, and begins to identify the interrelationships between what a person likes to do now and what future occupational role he may fill. The final level of the awareness stage, which occurs approximately in grade 3, focuses on the work activities as they relate to goods and services and provides the background for classifying occupational roles and understanding their interdependence.

The Accommodation Stage (Grades 4-6)--At this stage the students exercise self-appraisal by expressing their own interests and talents in curricular and extracurricular activities while *at the same time*, they become familiar with occupational families that allow them to try-on *occupational* roles in their own process of self-appraisal. The third aspect of the Accommodation Stage is the emphasis on the need to formulate preferences and to control one's career by careful planning and decision-making. Students will learn the complexity and significance of such decisions and the need for devoting attention to them.

The Exploration Stage (Grades 7-8)--This stage stresses "the undeniable relationship between educational preparation" (as pursued in grades 9-12) and subsequent career options. This stage, then, is devoted to preparing students for decisions concerning their high school studies. The first level of this stage involves the study of Economics and Career Planning in which the student learns the changing nature of the labor market, the related needs for education and training for the future, and the relationships among the economic, social, and psychological aspects of work. This process is intended to improve students understanding of why people work and to help them identify those factors of work that are of primary importance to them.

The second level of the exploration stage--exploration and decision-making--involves the formulation of preferences for occupations that are studied in depth and related to the knowledge that students have of themselves. "The culmination of this unit will be the planning of a projected high school program that is compatible with self characteristics and occupational goals."

Implementation Approach

The CDCP implementation approach is highlighted by several important aspects.

- The materials and activities emphasize job families and broad interest areas instead of specific occupational titles. Rather than viewing one occupation in the hospital setting (e.g., a licensed practical nurse), the student learns how all occupations in health care work together as a team. In such a context, students can begin to see the various types of competency and levels of skill that are required by each occupation in a family. This helps the student to explain why some occupations require more training or different training than others, even within the same occupational family.

- Concrete activities concerning work will receive a high priority. Role playing, games, and simulation of economic activity by actual production and distribution in the classroom will comprise an important part of the CDCP.

The CDCP staff is continuing the development of student and teacher material. Future activities will include field testing, preparation for commercial publication, and continuing the generation of additional CDCP materials.

OCCUPATIONAL CLUSTERING SYSTEMS

The need for some system to aggregate and organize all of the work that exists in our society into an understandable framework has always existed for guidance programs and personnel. With the advent of career education programs in public education, the need for such a career or occupational system takes on added significance. Career education programs require a clustering system that permits clear presentation of work in society to students at all levels in the education system. In addition, career education programs require a clustering system that can also provide a foundation and logical structure for development of career curricula for classroom programs at all levels.

A variety of systems has been used by school systems and guidance publishers in recent years. Some single systems are widely used, and others are developed by individual school systems and program designers based upon their individual and local needs. But even those systems that are individually developed will generally rely upon the design concepts embodied in one of the more widely used systems.

One of the keys to integration of Navy careers into career education programs and standard career guidance materials lies in the ability of the Navy to properly locate its careers in widely used career clustering systems. The ability of career educators of all types to present Navy opportunities in the same context as comparable civilian opportunities for the same occupations will be enhanced if Navy materials describing opportunities are linked to clustering systems in use.

Overview of Selected Clustering Systems

Because understanding of key clustering systems is an important element in the success of the Navy-career education approach, a review of selected systems is appropriate at this point. The following clustering systems are included in this review:

- Dictionary of Occupational Titles (DOT)--Developed by the U.S. Department of Labor (DOL), this system includes all occupations recognized by DOL, is probably the most widely known of all systems, and is the foundation for most other systems.

- HumRRO Occupational Clustering System--This system was developed under contract by the Human Resources Research Organization (HumRRO) to support the school-based career education model. While the school-based model developers modified and adapted the system to their requirements, the HumRRO system will probably influence other program developers in the future (e.g., the Career Development for Children Project, previously described, utilizes this system in structuring families of occupations).

- Comprehensive Career Education Model--Career Information System (CIS)--Previously described in this section, the CIS is a major component of the school-based model. The CIS clusters, which are very similar to the HumRRO clusters, will be more widely utilized as the school-based model is diffused.

- Oregon Occupational Clustering System--This system has been developed to meet local needs in Oregon, and is included in this review only as an example of such a locally-developed clustering approach.

- Vocational Education and Occupations--This system, developed by the U.S. Office of Education, has been widely used in vocational education programs for several years, and is the basis for federal reporting on public vocational programs.

- USOE Career Clusters--This system is being developed by the U.S. Office of Education expressly for wide dissemination to school systems developing career education programs. It is comprised of 15 functional groupings of work. Work is underway at USOE to fit the Vocational Education and Occupations categories into these new USOE career clusters.

Clustering Concept

Although each of the six systems in this review have certain unique characteristics, their objectives are quite similar. In general the cluster concept is an organizational approach used to identify for individuals, the skills, knowledge, and attitudes required for entry into a family or cluster of occupations. In an economy increasingly characterized by rapid technological change in work skill and knowledge requirements, the clustering approach is designed to help students avoid the hazards of premature commitment to a narrow work specialty and, at the same time, to provide sufficient exposure to the world of work to enable the student to cope more effectively with occupational and employment changes.

Given these general objectives, numerous clustering systems have been developed. The differences in these systems result from a number of factors, including the background and orientation of the people who developed the particular system, the particular characteristics of the student population to which the system is directed, if, in fact, it is developed for a particular population, and the characteristics of the existing educational systems. A clustering system cannot wait for a total restructuring of the existing school system to be effectively implemented.

Despite these differences, however, each system is designed to be broad enough to include most jobs in the world of work, including jobs at all skill levels and requiring different levels of skills and knowledge. In addition, the systems are designed to deal with the realities of the American labor force and be readily identifiable to a group of employers. For these reasons, many of the systems have made use of the DOT classification of occupations because it provides the only widely disseminated body of materials on which a substantial amount of work already has been completed. Thus, many clustering systems, while having different cluster categories, still utilize the DOT system to describe and categorize jobs under each cluster. Of the six systems included in this review, five utilize the DOT system in some respect.

The following paragraphs present a description of each selected clustering system, including a list of the major cluster categories, the general purpose for which the system is intended, its relationship to or use of other systems, and the use of the system in educational planning. Also included is a summary comparison of the systems in terms of a number of key factors, including the number of cluster categories, cluster orientation, job coverage, and use in educational career development. Finally, the systems are compared in terms of the degree of similarity across individual cluster categories.

Descriptions of Selected Clustering Systems

Dictionary of Occupational Titles (DOT).[18] A system developed by the U.S. Department of Labor to classify and describe jobs, it contains several components or dimensions. The first dimension consists of a six-digit code covering approximately 21,000 jobs. The first digit groups jobs into nine major occupational categories. The nine categories are:

- Professional, technical, and managerial occupations (e.g., medicine and health, mathematics and physical science, etc.)
- Clerical and sales occupations (e.g., salesmen, stenography, typing, etc.)
- Service occupations (e.g., domestic service, barbering, cosmetology, etc.)
- Farming, fishery, and related (e.g., animal farming, forestry, etc.)
- Processing occupations (e.g., processing of food, tobacco, etc., processing of leather, textiles, etc.)
- Machine trades (e.g., metal machining, printing, etc.)
- Bench work occupations (e.g., occupations in fabrication, assembly, and repair of metal products; occupations in assembly and repair of electrical products, etc.)
- Structural occupations (e.g., welders, flame cutters, and related; construction, etc.)
- Miscellaneous occupations (e.g., motor freight, logging, transportation, etc.).

---

[18]U.S., Department of Labor, *Dictionary of Occupational Titles* (Washington, D.C.: U.S. Government Printing Office) 3rd edition, 2 vols, 1965.

These nine categories are broken down into a total of 83 occupational divisions, e.g., Occupations in Mathematics and Physical Sciences under the occupational category Professional, Technical, and Managerial occupations. A two-digit code describes these divisions.

The occupational divisions are then broken down into a total of 603 occupational groups, e.g., Occupations in Physics under the occupational division Occupations in Mathematics and Physical Sciences. A three-digit code describes these groups.

For each of the three-digit occupational groups, another three-digit code is used to describe the relative status or level of the occupation with respect to its relationship to data (fourth digit), people (fifth digit), and things (sixth digit). This three-digit code describes both the orientation of the job as well as the relative degree of complexity. A total of eight levels is used to describe the level of complexity for each of the three variables--data, people, and things. For example, the code 238 would indicate a relatively high degree of complexity with respect to people (supervising people) and no significant relationship with respect to things.

Each of the three-digit occupational groups is described by this additional three-digit code. Using this additional code permits a reader, such as a teacher or student, to assess various occupational information relative to his preferences or ability for selected job functions (i.e., relationship to data, people, and things).

For each six-digit code, several titles are given for various jobs which fit each code. A narrative description is also given of the functions, responsibilities, and level of complexity for each six-digit code.

A second dimension of the DOT system consists of a series of three-digit codes describing categories of jobs that are grouped together because of their similarity to the type of work performed, worker requirements, training requirements, and methods of job entry. The "worker trait groups" described by the three-digit codes are grouped by 22 broad "areas of work." Examples of areas of work include art, clerical work, crafts, merchandising, machine work, medicine and health, and writing. The DOT six-digit occupational groups that relate to each worker trait group are indicated as appropriate. This second dimension of the DOT system permits the reader to evaluate occupations with respect to specific worker traits and worker requirements.

HumRRO Clustering System.[19] This system was developed by the Human Resources Research Organization to support the Comprehensive Career Educational Model (CCEM) being prepared by the Center for Vocational and Technical

---

[19]John E. Taylor, Ernest K. Montague, and Eugene R. Michaels, *An Occupational Clustering System and Curriculum Implications for the Comprehensive Career Education Model* (Alexandria, Virginia: Human Resources Research Organization), 1972.

Education, the Ohio State University. Although it is clearly related to the DOT, it is much more directly related to educational needs.

This system was designed under three general criteria: to encompass most existing jobs; to be translatable to the design of an entire K-12 curriculum; and to demonstrate specific advantages over other clustering systems.

This system actually consists of several clustering methods, designed to fulfill the vocational and educational needs of different grade levels. In one method, jobs are categorized by 12 broad institutional fields. The 12 fields are:

- Public Service--Governmental
- Transportation
- Manufacturing
- Natural Resources--Production
- Resources--Control and Conservation
- Commerce and Trade
- Communication and Media
- Construction
- Personal Development and Recreation
- Creative Arts
- Health, Family, and Public Welfare
- Education, Training, and Research.

The 12 institutional fields are arrayed against seven socioeconomic or status levels:

- Unskilled
- Semiskilled
- Skilled
- Highly skilled
- Semiprofessional and professional
- Advanced professional, planner
- Executive, upper manager, high-level planner.

To aid understanding, examples of jobs are given in the matrix formed by the field and status level categories. A similar matrix is constructed by breaking down the 12 institutional fields into more detail. For example, under Public Service, there are seven categories:

- Post Office
- Public Control Regulation
- Defense
- Political and Appointive Office
- Construction and Planning
- Public Utilities
- Health and Welfare.

The seven status levels described earlier are also arrayed against each of these detailed institutional fields. Within each cell of the matrix, titles of jobs are given; e.g.,

Field	Status Level	Job
Post Office	Semiskilled	Clerk, Carrier
Defense	Skilled	NCO, Specialist

This method, by clustering broad institutional fields along the status dimension, permits the development of a general appreciation of both the presence of general levels and the important implications of differing statuses.

The 12 institutional areas were derived using a number of sources including USOE, Census Bureau, and DOT classification.

A second method in the HumRRO system is more closely allied to an occupational or job functional approach. This matrix is based on the DOT classification. In this method, the 12 DOT broad occupational groups and the 83 DOT occupational divisions (second-level DOT breakdown) are arrayed against the seven status categories. As before, titles of jobs are given in the cells formed by this matrix. For example:

DOT Occupational Category	Occupational Division	Status Level	Job
Clerical & Sales Occupations	Stenography, Typing, Filing, etc.	Skilled	Stenographer, Bookkeeper
Service Occupations, Food and Beverage	Preparation and Service	Highly Skilled	Head Waiter, Chef

The two methods, with some modification, are designed to be used in developing educational programs for a range of educational grade levels. Varying types of cluster information to support these programs are presented in the career education groupings of grade levels, as shown in the following chart:

Grade Level	Cluster Information Presented
Grades K-6 (career awareness)	Two very broad institutional areas-- Goods (Institutional areas 1-9) and Services (Institutional areas 10-12)
	Two career levels-- Lower (Status levels 1-4) and Higher (Status levels 5-7)
Grades 7-8 (career orientation)	Five broad institutional areas-- Arts; Sciences; Commerce; Industry; Service, Health, and Welfare
	Three career levels-- Lower, Middle, Higher
Grades 9-11 (career exploration)	Twelve institutional areas or nine DOT occupational groups arrayed against seven status or career levels

Overlaying the 12 institutional areas with the nine DOT occupational groups provides a means of relating various types of jobs to various institutional settings. Using the two methods and variations thereof at various educational grade levels provides a means of developing appropriate curricula for each of these grades.

Career Information System (CIS).[20] A component of the Comprehehsive Career Education Model, this system is being designed at the Center for Vocational and Technical Education, the Ohio State University, to serve as a general model for school-based career education development by local and state education agencies. The clustering system utilized in the Career Information System is based principally on the HumRRO system described earlier. In addition, the DOT occupational definitions serve essentially as the foundation for this educationally-oriented system.

There are three basic components of the Career Information System. The first consists of a grouping of occupations in terms of the basic product or service provided. Increasing levels of detail are provided for use in educational curriculum development at various grade levels. This first component is illustrated in Figure 7.

---

[20]Adams, *Career Information System*, see p 47 of this report.

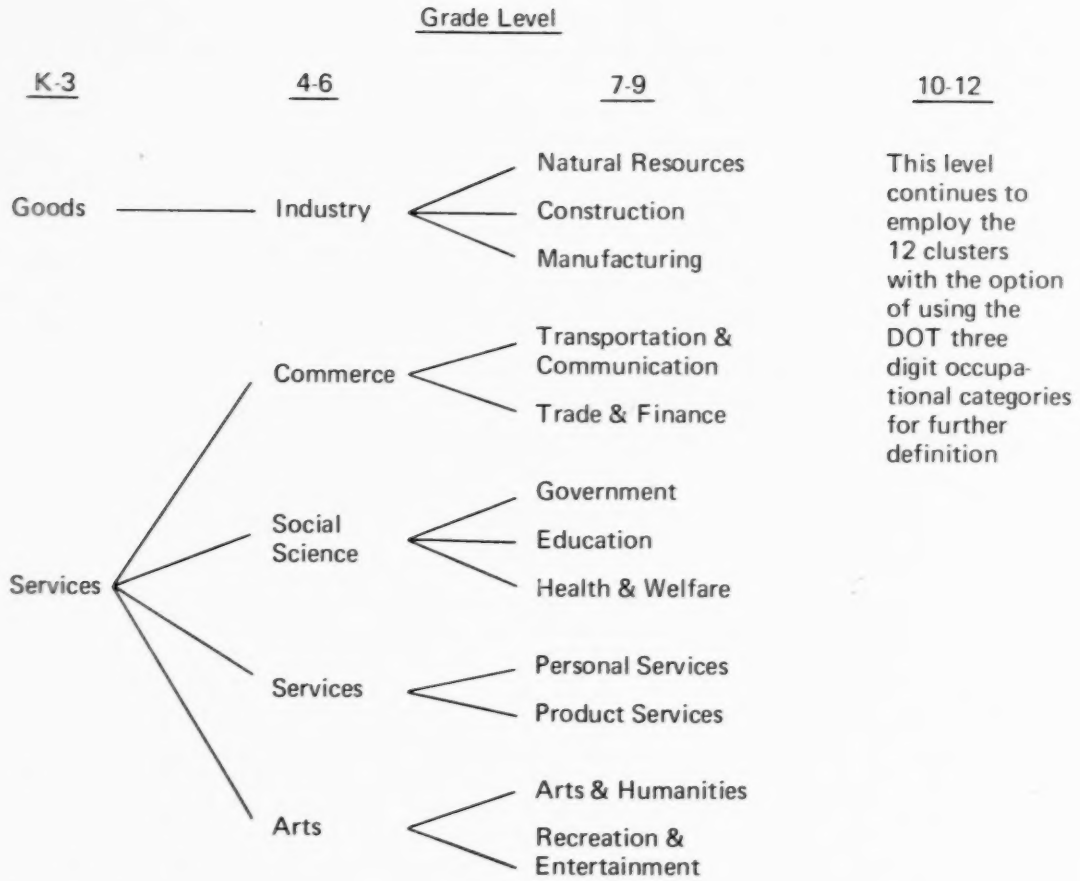


FIGURE 7. FIRST COMPONENT OF THE CAREER INFORMATION SYSTEM

The second component involves describing specific occupations in terms of their related occupational groups. The clustering organization of the occupational groups is as follows:

- Grades K-3--Occupations in Goods and Services clusters are grouped horizontally by the basic tasks performed. Managers, leaders, and policy makers can be grouped together, while technicians and craftsmen and general workers are organized into separate groups based on the common or related tasks performed by the workers.

- Grades 4-6--The five major clusters used at grades 4-6 are divided into the nine occupational categories (first digit of DOT code number).

- Grades 7-9--The twelve clusters used at grades 7-9 are divided into the 83 occupational divisions (second digit of DOT code number).

- Grades 10-12--The twelve clusters are divided into the DOT occupational groups (third digit of DOT code number).

The third component involves describing the characteristics of the worker such as traits, aptitudes, and vocational interests. In this description, the DOT job function level descriptions (last three digits of DOT code) are used along with the DOT Worker Trait Groups and Worker Trait Arrangements. The job function level description indicates the level or complexity of the job in its relation to data, people, and things. The worker trait groups and worker trait arrangements involved the groupings of occupations based upon the similarity of worker traits (e.g., worker requirements, type of work performed, etc.). As with the other components, increasing levels of detail are provided for higher grade levels as the student advances in the educational process and moves closer to job entry.

Oregon Occupational Clustering System.[21] This clustering system was developed by the Oregon Board of Education for use in educational planning throughout the state. The orientation of this system is educational, i.e., the clustering categories are broad curriculum categories, which serve a number of occupations. These categories are the following:

- Agriculture
- Food Services
- Health

---

[21]Oregon Board of Education, "Guide to Career Education," see p 69 of this report.

- Accounting-Bookkeeping
- Clerical
- Steno-Secretarial
- Basic Marketing
- Construction
- Electricity-Electronics
- Industrial Mechanics
- Metals
- Wood Products.

Under each of the 12 major curriculum categories, the principal occupations served by each curriculum are listed by a six-digit DOT code. For example, under the Food Service Curriculum, related occupations include bus boy, fountain man, cook, counterman, waiter, chef, baker, and meat cutter. Present and forecasted employment for each of these occupations is listed. For each of the 12 curriculum categories, a suggested curriculum pattern (i.e., type of courses) is presented for the 7th through 12th grades. In this curriculum, specialized courses pertaining to the occupational category are offered in the 11th and 12th grades. Because this system was originally developed to support vocational education programs in the state, professional and managerial occupational levels are not visible in this system at this time.

Vocational Education and Occupations.[22] This system was developed by the U.S. Office of Education and the Manpower Administration to provide a standardized means to assist state and local agencies in identifying, classifying, and describing items of information about various occupational and curriculum categories. As in the Oregon example, clusters in this system are actually curriculum categories designed to support a variety of occupations.

There are seven major clusters or curriculum categories. These are:

- Agricultural Education
- Distributive Education
- Health Occupations Education

---

[22]U.S., Department of Health, Education, and Welfare and Department of Labor, *Vocational Education and Operations* (Washington, D.C.: U.S. Government Printing Office), 1969.

- Home Economics Education
- Office Occupations Education
- Technical Education
- Trade and Industrial Occupations.

For each of the seven major course categories, a number of educational instruction programs are listed. For each of these programs, DOT job titles and codes are given. These instructional programs are not associated with any particular levels of education (e.g., secondary, adult, etc.) but are general in nature. As an example, the instructional programs under agriculture are:

- Agricultural Production
- Agricultural Supplies and Services
- Agricultural Mechanics
- Ornamental Horticulture
- Agricultural Resources
- Forestry
- Others.

Some of the instructional programs under the seven major categories do not describe specific jobs (e.g., graphic arts under trade and industrial occupations) while others are more directly related (e.g., watch making and repair under trade and industrial occupations). Each of these instructional programs is broken down further into two additional classification levels. The classification is described in more detail as follows:

- First two-digit position--major category or subject area, e.g., 14 - Office Occupation Education
- Second two-digit position--principal segment of subject matter, e.g., 14.02 - Business Data Processing System Occupations
- Third two-digit position--division of principal segment, e.g., 14.0202 - Peripheral Equipment Operators
- Fourth two-digit position--first level detail of division of principal segment, e.g., 14.020201 - Key Punch and Coding Equipment Operators.

For each of the three latter levels, DOT occupational titles and codes are given, along with DOT worker trait groups.

This system provides convertability from specific DOT titles into corresponding vocational instructional training programs. It may be used to identify jobs for which a completed vocational education program has prepared an individual, and to identify pertinent training programs or courses that provide training for occupations for which there are realistic job openings or opportunities.

Professional and managerial occupations (as described by the DOT system) are, for the most part, not covered by this system. This is due to the fact that this system was originally developed to support vocational education programs, and so did not encompass all occupational levels.

USOE Career Clusters.[23] This system, being developed by the U.S. Office of Education, appears to be more functionally oriented than the other clustering systems reviewed. This system describes broad categories of jobs or major functions and activities involved in various jobs, as opposed to specific occupational categories. In general, specific occupations or jobs are not described. There are 15 clusters in this system:

- Personal Services (e.g., Physical Culture, Barbering)
- Construction (e.g., Contracting, Landscaping)
- Public Service (e.g., Financial, Urban Development, Regulatory Services)
- Manufacturing (e.g., Materials, Production)
- Transportation (e.g., Land Transportation, Aerospace Transportation)
- Health Occupations (e.g., Health Information Systems, Health Service Delivery)
- Consumer and Homemaking-Related Occupations (e.g., Food Service; Child Care, Guidance, and Teaching)
- Agricultural Business and Natural Resources (e.g., Forestry, Research, Land and Water Management)
- Communication and Media (e.g., Publishing, Audiovisual, Language)

---

[23]Materials describing USOE career clusters have not yet been published. Unpublished materials were supplied to ORI.

- Business and Other Occupations (e.g., Record Systems and Control, Secretarial)
- Environment (e.g., Soil and Mineral Conservation and Control, Environmental Health Services)
- Fine Arts and Humanities
- Hospitality and Recreation (e.g., Environmental Management, Community Services)
- Marine Sciences Occupations (e.g., Marine Biology, Commercial Fishing)
- Marketing and Distribution (e.g., Buying, Sales, and Services).

Each of the 15 clusters is further divided into second, third, and fourth levels of detail. For example, under Personal Services, the second division level includes Physical Culture, Barbering, Mortuary Science, Cosmetology, and Household Pet Services. With respect to the Barbering category, the fourth level breakdown includes Shampooing, Hair Styling, Shaving and Facial Treatment, Scalp and Skin Treatment Operations, and Styling and Restoration of Hair Pieces. Thus, even at the fourth level of detail, this system does not designate specific occupations, jobs, or job titles, but instead designates the functions or activities performed on the job. An even more striking example can be shown by the Public Service cluster. One of the second level clusters is termed "Financial," which is further divided into two third-level clusters--Revenue and Disbursement. The Revenue cluster is subdivided into Taxation, Bonds, and Fees. Clearly, none of the four cluster levels describes specific jobs, but instead describes functions, activities, or subject areas involved in a broad occupational category.

Comparison of Selected Clustering Systems

Table 3 provides a summary comparison of the clustering systems described in the preceding paragraphs. This comparison includes the following characteristics of the systems.

- Number of major career or curriculum cluster categories
- Existence of, and number of, secondary division levels or clusters
- Cluster orientation
  - Institutional (i.e., broad product, goods, or services categorization as opposed to occupational designation)

TABLE 3

SUMMARY COMPARISON OF CHARACTERISTICS OF SELECTED CLUSTERING SYSTEMS

Clustering System	Number of Major Cluster Categories	Number of Secondary Cluster Levels	Cluster Orientation	Degree of Job Coverage	Use of DOT System	Relationship With Educational Curriculum Development	Inclusion of Specific Job Titles and Description	Provision of Status Level, Job Complexity Indicators
DOT	9	2	Occupational	All jobs covered	----------	Not tied in with specific educational curriculum development	Yes	3 digit code describes level & complexity relative to data, people, & things. Worker trait groups provide descriptions of job functions, training requirements, etc.
HumRRO	12 in one method 9 using DOT system	1 in one method Using DOT system permits 2 levels	Institutional via 1 method Using DOT provides occupational orientation	All jobs covered	Yes--to cluster & categorize jobs as well as give examples of jobs for major cluster categories	Guidelines specified for using clustering system in structuring curricula	Examples of jobs falling under cluster specified. Jobs also specified by DOT codes.	Special seven level status descriptor used as well as DOT codes.
CIS	12 in one method 9 using DOT system	2 in one method Using DOT system permits 2 levels	Institutional via 1 method Using DOT provides occupational orientation	All jobs covered	Yes--to cluster & categorize jobs as well as give examples of jobs for major cluster categories	Clusters used to develop curricula for various grade levels	Yes--through DOT codes	Yes--through DOT codes
Oregon	12	None	Educational	Does not appear to cover professional & managerial occupations	Yes--to give examples of jobs related to major curriculum categories	Curricula specified for various grade levels for major cluster categories	Yes--through DOT codes	Yes--through DOT codes
Vocational Education & Occupations	7	3	Educational	Does not appear to cover professional & managerial occupations	Yes--to describe relationship of jobs to major curriculum categories	Clusters themselves are general curricula and instructional programs	Yes--through DOT codes	Yes--through DOT codes
USOE Career Clusters	15	3	Functional	Does not appear to cover some jobs at secondary cluster levels probably due to functional structure of clusters	No	Not tied in with specific educational curriculum development at this time	No	No

  - Occupational (i.e., designation of major occupational category)

  - Functional/activity (i.e., categorization by broad functions or activities performed in the work world as opposed to specific occupations)

  - Educational (i.e., designation of major curriculum categories which support a variety of related occupational categories)

- Degree of job coverage (i.e., degree to which all jobs in the world of work are covered by the system)

- Use of DOT system (i.e., way in which DOT system is utilized by each clustering system)

- Relationship with educational curriculum development (i.e., indication of whether clustering system is tied in with educational curriculum development and whether curricula have been developed for major job clusters

- Other key system characteristics

  - Use of specific job titles or descriptions

  - Indication of status level, complexity, functions, etc., associated with occupations.

In addition to this comparison, the systems may also be compared in relation to the degree of similarity of individual cluster categories. A given cluster category in one system may in fact be identical, or very similar, to a cluster in another system. The total number of major cluster categories in the systems is 67; however, many categories are either identical or very similar.

This comparison of cluster categories is presented in Table 4. The matrix used is structured as follows: The cluster categories which appear to be distinct from other categories are listed down the first column of the page. Where a cluster in another system, or even the same system, appears to be similar to a listed cluster, this similar cluster is listed below the first designation. The number of parentheses following each cluster title indicates the system that that cluster is part of. The six systems are listed in columns across the page and are numbered (1) through (6). Where the given cluster category or similar category is found in one of the systems, an X is placed in the appropriate cell of the matrix.

As an example, in reading the matrix, consider cluster number 3, Service Occupations. As indicated in the matrix, this cluster is found in the DOT, CIS, and USOE Career Cluster systems. It is designated by one other name, Personal Services, in the CIS and USOE systems. (Service Occupations is the name given by the DOT system.)

TABLE 4

COMPARISON OF SIMILARITY IN CLUSTER CATEGORIES
ACROSS SELECTED CLUSTERING SYSTEMS

Distinct Cluster Categories	DOT (1)	HumRRO (2)	CIS (3)	Oregon (4)	Vocational Ecudation & Occupations (5)	Office of Education Career Clusters (6)
1. Professional, technical, and managerial occupations (1)	X					
2. Clerical and sales occupations (1) Accounting-Bookkeeping (4) Clerical (4) Steno-Secretarial (4) Office occupation education (5) Business and other occupations (6)	X			X	X	X
3. Service occupations (1) Personal services (3), (6)	X		X			X
4. Farming, fishery, and related occupations (1) Agriculture (4) Agricultural business and natural resources (6)	X			X	X	X
5. Processing occupations (e.g., processing of food, tobacco, etc., processing of leather, textiles, etc.) (1)	X					
6. Machine trades (e.g., metal machinery, printing, etc.)	X					
7. Bench work occupations (e.g., occupations in fabrication, assembly, and repair of metal products, occupations in assembly and repair of electrical products, etc.) (1)	X					
8. Structural occupations (1) Construction (2), (3), (4), (6)	X	X	X	X		X
9. Miscellaneous occupations (e.g., motor freight, logging, transportation, etc.) (1)	X					
10. Public Service-Governmental (1) Government (3) Public service (6)		X	X			X
11. Transportation (2), (6) Transportation and Communication (6)		X	X			X
12. Manufacturing (2), (3), (6)		X	X			X
13. Natural resources--Production (2) Natural resources (3)		X	X			
14. Resources--control and conservation (2) Environment (e.g., soil and mineral conservation, environmental health services, etc.) (6)		X				X
15. Commerce and trade (2) Trade and finance (3) Basic marketing (4) Distributive occupations (5) Marketing and distribution (6)		X	X	X	X	X

TABLE 4 (Cont)

	Distinct Cluster Categories	DOT (1)	HumRRO (2)	CIS (3)	Oregon (4)	Vocational Education & Occupations (5)	Office of Education Career Clusters (6)
16.	Communications and media (2), (6) Transportation and communication (3)		X	X			X
17.	Personal development and recreation (2) Recreation and entertainment (3) Hospitality and recreation (6)		X	X			X
18.	Creative arts (2) Arts and humanities (3) Fine arts and humanities (6)		X	X			X
19.	Health, family, and public welfare (2) Health and welfare (3) Health occupations (4), (6) Health occupations education (5)		X	X	X	X	X
20.	Education, training, and research (2) Education (3)		X	X			
21.	Product services (3)			X			
22.	Food services (4) Home economics education (5) Consumer and homemaking-related occupations (6)				X	X	X
23.	Electricity-Electronics (4)				X		
24.	Industrial mechanics ( )				X		
25.	Metals (4)				X		
26.	Wood products (4)				X		
27.	Technical education (5)					X	
28.	Trade and industrial occupations education (5)					X	
29.	Marine sciences occupations (6)						X

The remaining distinct clusters are described similarly. Of the 67 cluster categories, there appear to be 29 distinct categories. This, of course, is approximate, in that full documentation explaining the contents of each of the 67 clusters was not available, and thus some judgement had to be used in identifying clusters which appeared to be similar.

It is interesting to note the degree of similarity of the various cluster categories. Of the 29 distinct clusters:

13 are found in 1 system only

3 are found in 2 systems only

8 are found in 3 systems only

2 are found in 4 systems only

3 are found in 5 systems only

none are found in all 6 systems reviewed.

The cluster categories which appear to be most common (i.e., found in three or more of the selected systems), are:

- Clerical and Sales Occupations (Accounting-Bookkeeping, Business Occupations, Office Occupations)
- Service Occupations (Personal Services)
- Agriculture (Farming, Fishery Occupations)
- Construction (Structural Occupations)
- Public Service-Governmental
- Transportation
- Manufacturing
- Commerce and Trade (Trade and Finance, Marketing and Distribution)
- Communication and Media
- Recreation and Entertainment (Personal Development and Recreation, Hospitality and Recreation)
- Arts and Humanities
- Health and Welfare Occupations
- Home Economics (Food Services, Consumer and Homemaking)

FINDINGS AND RECOMMENDATIONS

IV. FINDINGS AND RECOMMENDATIONS

INTRODUCTION

This section contains a discussion of the study findings and recommendations to the Navy resulting from interviews with educators involved in career education and appropriate Navy personnel, review of career education research and development, and review of Navy materials and procedures for career orientation and manpower procurement.

The broadest finding of the study is that integration of Navy career information into career education programs is feasible. Career education, as an approach to education, appears likely to continue to grow, and educators and Navy personnel concur that Navy support of career education is desirable because it will benefit both the Navy and the education community. Current Navy procedures and materials can be modified, at reasonable cost, to provide high quality inputs to career education programs.

Findings and recommendations have been organized under two major headings in this section. The first, General Findings and Recommendations, contains overall considerations affecting the Navy's decision to initiate an approach to career education. The second heading, Recommendations for Navy Action, contains specific recommendations for developing and implementing the Navy's approach to career education.

This section also contains a summary of the potential utility of Navy career materials specific to the four major career education models being developed under the auspices of the National Institute of Education (NIE), a discussion of the selected action which ORI considers to be most significant for Navy integration into career education, and a preliminary estimate of cost factors to be anticipated by the Navy for each of the actions recommended in this section.

Overview of General Findings and Recommendations

1. Career education has achieved such momentum that it will, in the foreseeable future, be an important educational approach. Consequently, it is recommended that the Navy consider career education as a context in which closer ties can be built with the public education system in the 1970s and beyond.

2. The growth of career education is occurring at a pace which will both permit and require continuing support from organizations outside the school systems. It is recommended that the Navy, in its role as a major employer, provide such support where appropriate.

3. In general, career education programs, like many other segments of American society, have not yet recognized the importance of the Navy and other military branches as components of lifelong career education. To increase interest in the diversity of Navy work, it is recommended that the Navy should emphasize that the Navy's pay and benefits, which are widely advertized, are the just reward for challenging, demanding work well done.

4. Educators recognize the quality of Navy training materials and have expressed a desire to use more of them in the public schools. Accordingly, it is recommended that the Navy make such materials more readily available, and that specific career education curriculum materials be developed.

5. Preliminary analysis indicates that most Navy work specializations have clear counterparts in civilian institutions. The greatest differences between the military and civilian portions of American society seem to involve characteristics of the social environment, rather than work specializations. It is recommended that the Navy take action to ensure that its career opportunities are described at the same time and in the same manner as civilian opportunities that include the same career specializations. Concurrently, the Navy should undertake research in two areas. First, the apparent similarity between Navy specializations and occupations in civilian life should be verified. Second, the Navy should define the ways in which the Navy environment can be compared to, and contrasted with, the civilian work environments.

6. Educators who have been introduced to the concept of integrating Navy careers into career education programs are unanimously in favor of the concept. As a result, it is suggested that the Navy can rely on support from the education community for any Navy efforts to adopt a valid career education approach to school systems.

7. Educators warned that any Navy attempts to construct a valid career education approach to schools must be education-oriented; that is, the approach should be devoid of recruiting flavor. ORI recommends, therefore, that any Navy materials which may be produced to integrate Navy career information into career education programs merely provide an accurate picture of Navy work and the Navy way of life--its disadvantages as well as advantages.

8. The success of a Navy career education approach will depend on coordinated action by many Navy organizations. It is recommended that the Chief of Naval Operations consider initiation of such coordination. The development of a coordination plan is also recommended.

Overview of Recommendations for Navy Action

1. Career education developments and current Navy efforts allow for the development of career guidance materials that will expedite integration of Navy work with perceptions of civilian work. Several of these are recommended and described in detail. The most important opportunities consist of revising current descriptions of Navy career opportunities for use in career guidance materials, and attempting to integrate Navy opportunities, by occupation, into the *Occupational Outlook Handbook* of the U.S. Department of Labor.

2. Opportunities also exist for the revision and direct use of Navy training materials in public school systems, both to exemplify Navy work and to provide needed inputs to the overall career education program effort. ORI recommends and describes several ways in which this might be accomplished.

3. Career education also provides the opportunity for the Navy to increase the frequency and significance of its liaison activities with other agencies and institutions that are involved in career education. Both agencies to be involved and objectives of liaisons are discussed.

GENERAL FINDINGS AND RECOMMENDATIONS

Finding

Career education, as an approach to public education, has achieved such momentum that it will be an important educational movement for the foreseeable future.

Local, state, and federal programs in career education are growing in number. Most significant, perhaps, is the fact that some local and state education agencies have adopted career education approaches without the incentive and support of federal funds. Such local and state initiatives indicate the existence of educator and public support that will sustain the movement even if the federal education agencies rearrange priorities.

Recommendation. The Navy should consider career education as the setting for building stronger ties with the education community during the 1970s and beyond. Although an early start on the Navy's involvement is highly recommended, gradual involvement by the Navy during the current decade should also be beneficial in achieving Navy manpower objectives.

Other service branches could also adopt a career education approach with equal assurance of future benefit.

From the viewpoint of representatives of the Office of the Assistant Secretary of Defense (M&RA), the national career education movement represents a major opportunity for integrating the military services more fully with the rest of American society. Such integration should prepare a larger number of citizens for supporting the national security, through military service and/or through constructive participation in other actions intended to improve the armed forces.

Finding

Many educators are involved in debate concerning the future of career education and its potential merits. Criticisms of career education deserve attention, although they are based on speculation about its effects rather than on historical observation of career education operations. These criticisms are noteworthy, because their authors are prestigious, and because their warnings reflect sound reasoning and extensive experience.

The following criticisms are extracted or paraphrased from the *Proceedings of the Conferences on Career Education*, Princeton, N.J., Educational Testing Service, 1972. They are presented to identify for the Navy some of the major controversies that are likely to arise regarding the career education approach, and to enable the Navy to view career education from as objective a perspective as possible.

Address by Paul Woodring, Distinguished Service Professor, Western Washington State College, pp 17-23.

Career education *may* result in providing education which is so specific and specialized that it is economically useful in the short run, but severely limiting in a world which requires great adaptability to change.

Schools have the responsibility for preparing students for many aspects of life other than work. This is especially true in a free society, which depends upon active citizen participation in activities other than their employment.

Career education, if taught badly, is as bad and frustrating as any other teaching that is presented badly. Thus, adoption of the career education approach does not assure improvements in education.

Because of its focus on economic activity, career education may guide upwardly mobile, disadvantaged students into narrow vocational courses which promise rapid monetary return, whereas some of their greatest opportunities may be in professions which require broad academic study.

For many students, high school is not the only place where they may receive job or skill specific training. Many other post-high school opportunities for training exist.

Address by Harold Howe, Vice President, Division of Education and Research, The Ford Foundation; formerly, United States Commissioner of Education, pp 25-35.

The concept of career education "is so general that it runs the danger of being watered down into a mass of lip-service activity that brings about no fundamental change in the schools."

"The danger is that we have a concept here that is extremely easy to espouse without doing anything really meaningful in the way of changing schools so that they will serve young people better."

There has not been enough emphasis in career education literature on teaching people to "read, write, figure, speak, and listen." These subjects may be most important in the successful pursuit of careers.

Career education occupies too much of the educational stage, to the detriment of other concepts that deserve attention.

Career education may lull students into believing that jobs and work are the only worries of life. This is too narrow a view for citizens who must face problems of war, environment, equal opportunity, and personal morality.

Address by Gus Tyler, Assistant President, International Ladies Garment Workers Union, pp 63-99.

Career education may turn the whole education system into a "prep school for making money with the be-all and end-all of education becoming job and pay." Education must do more than this.

Career education may be taken over by persons who are interested in their own enrichment rather than in implementing an educational renewal.

Recommendation. If the Navy attempts to approach the schools within a career education context, the Navy should acknowledge that excessive adoption of specific career education concepts prevents the intent of career education and creates new problems for students and educators. ORI believes that the recommendations included in this report and the rationale for integrating Navy career information into career education programs (Section II) are not excessive. Nevertheless, the Navy should use the criticisms cited above to assess each of ORI's recommendations and any other career education ideas that may develop. The Navy should also monitor career education developments to evaluate new objections to the career education approach.

Finding

The growth of career education is occurring at a pace which will both permit and require the continuing support of organizations and institutions outside of the school systems.

Career education has spread rapidly since 1971, when it first received national attention as an approach to education. It has not yet been implemented, however, in most school systems. ORI's investigation indicated that the limits on the growth of career education are imposed, to a great extent, by lack of materials which infuse career relevance into K-12 curricula and guidance activities. At the same time, the majority of teachers and counselors have not yet received training in how to develop and use their own curricula and materials. The result is that career education has grown slowly, but its growth will accelerate when more materials become available and more teachers have integrated career education techniques into their own curricula.

The release of the Comprehensive Career Education Model materials by the National Institute of Education in 1973 should spur the career education approach in the public schools. Other publishing efforts should have a similar positive effect. In many communities, workers and employers will make direct inputs of career relevance to the schools.

ORI finds the Navy in a position to advance the development of career education. The Navy as an employer, as a training and education institution, and as a publisher of career information materials can act to support career education.

Recommendation. The Navy should consider itself an employer, and where appropriate, attempt to provide Navy career information, training materials, facilities, and Navy personnel to support career education activities. This will serve to advance career education and to establish, among educators and students alike, a perception of the Navy as a major employer in the nation.

Finding

In general, career education programs have not yet recognized the importance and diversity of the Navy and other military services as components of the total career education process. Many segments of American society fail to recognize the fact that military personnel are involved in productive work. This is apparently true even among educators and industrial psychologists who have studied work extensively.

Recommendation. The Navy and other service branches should begin, as soon as possible, to behave in a way similar to civilian employers who emphasize that high pay and benefits accrue *only* as a just reward for work (which in itself has certain intrinsic rewards). Thus, the Navy is recruiting and rewarding all persons who are interested in pursuing their own career specialization within the physical and social environment that appertains to the Navy's missions. This recommendation would appear to be sound, even if career education programs did not exist.

With specific regard to career education programs, the Navy should continue to emphasize the quality and diversity of the training it provides. *In addition*, it is essential that the Navy stress the responsibilities, intricacies and rigors of work in the Navy that justify Navy training, pay, and benefits.

Finding

In general, educators do appear to recognize the value of the training courses that have been developed for use in the military. Some educators expressed a desire that such training course materials have greater dissemination among schools outside the military services.

Recommendation. As part of an overall program of Navy involvement in career education, the Navy should make training course materials more readily available for use in the public schools.

Finding

Preliminary analysis by ORI, and discussions with educators and Navy professionals, indicate that the primary differences in *career* opportunities in the Navy, as opposed to civilian opportunities, are entailed not in work specializations but in work environments. That is, virtually all Navy personnel are involved in activities that have a counterpart in civilian life. The physical and social environment, including the chain of command, military traditions, the Uniform Code of Military Justice, etc., is probably substantially different from the physical and social environment for civilian employment.

Recommendation (a). The Navy should begin as soon as practicable to assure that opportunities in the Navy should be described, according to the specializations they comprise, at the same time and in the same manner as civilian opportunities which also involve those specializations. In this way, educators and students will become more aware that several hundred job specialties can be practiced in the Navy.

Recommendation (b). Research (task analysis) should be undertaken to test the similarity between Navy and civilian work specialties. This should build on the base established by the *Military-Civilian Job Comparability Manual*, published by the Office of the Assistant Secretary of Defense (M&RA).

Recommendation (c). Research is also required to develop the concept of work environment and to define the ways in which military (Navy, Army, Marine Corps, Air Force and Coast Guard) environments differ from the civilian environment and from each other.

Finding

Educators who have been introduced to the concept of integrating military career opportunities into career education are unanimously in favor of the concept. They recognize that the Navy and the other service branches employ large numbers of people, and that the Navy can be an important segment of an individual's career development.

Recommendation. The Navy can rely on cooperation from educators in integrating Navy work specializations with similar specializations in the civilian environment within career education programs.

Finding

Educators, although enthusiastic about receiving Navy (military) career education information, consistently warn against the inclusion of recruiting enticements in the substance or rhetorical style of materials intended for use in school programs.

Educators agreed that Americans apparently know little about work in the armed forces. They acknowledged that as educators, it is within their responsibility to students to provide them with accurate information on military work. They insisted, however, that teachers and counselors could not use or distribute any materials or activities that are oriented to recruiting, except with students of recruitable age who express an interest in military service. Thus, materials must attempt to give an encompassing and accurate view of Navy work opportunities and the Navy way of life. This must include descriptions of the unpleasant as well as the pleasant aspects of Navy work and the Navy environment.

Recommendation (a). Any direct involvement of the Navy in support of career education should focus on educating students about work in the Navy, not on recruiting students to the Navy. Such involvement should attempt only to give *all* students a more accurate picture of the Navy than they now have. Because the Navy is an objectively attractive opportunity for many persons, *some* students, if they have an accurate view of Navy life, will seek employment in the Navy. This is not to say that the Navy Recruiting Command should not be involved in Navy efforts to support career education. Rather, this recommendation only warns that the Navy-career education effort, especially materials developed to support career education, should be devoid of recruiting flavor.

Recommendation (b). Recruiting activities should reinforce and build upon Navy support for career education. That is, recruiting efforts can emphasize that Navy service is a logical continuation of the career education that precedes it, and is itself career education relative to an individual's future work for the Navy or for other employers.

Finding

The success of a Navy-career education effort will depend upon coordinated action of the Navy Recruiting Command, the Bureau of Naval Personnel, the Navy Training Command and other Navy organizations.

This career education study was intended to help the Navy succeed in the AVF context. Thus, it was destined from the outset to lean heavily toward possible alternatives for the Navy Recruiting Command. ORI quickly realized that nonrecruiting approaches seemed advisable and that recruiting approaches which related to career education must be backed up by coordinated policies of the Bureau of Naval Personnel and the Navy Training Command. As the study developed, ORI discovered that other commands might also become involved, especially in opening (to some degree) Navy activities to educators and students.

Participation by several Navy organizations in a career education effort will also be vital to relationships with school systems. Materials, for example, will be more readily accepted if they are prepared as appropriate with the cooperation of the Navy Training Command, the Bureau of Naval Personnel, and the Navy Recruiting Command, rather than being issued from the Recruiting Command alone.

Recommendation (a). The Chief of Naval Operations should consider committing the Navy to supporting career education in ways that are appropriate to the needs of the Navy and the resources available. ORI anticipates that many Navy organizations will be involved, and that coordination by the Office of the Chief of Naval Operations may be required.

Recommendation (b). The Navy should inform all appropriate personnel, beginning with the Navy Recruiting Command, the Bureau of Naval Personnel, and the Navy Training Command, of the potential benefits to the Navy of establishing linkages with public school career education programs.

Recommendation (c). The Navy should undertake a management study to determine in detail the possible roles that all Navy organizations can play in implementing a career education program.

RECOMMENDATIONS FOR NAVY ACTION

The recommendations which follow in this section are based on ORI's discussions with experts, review of career education program needs and currently available Navy materials and procedures for disseminating career information. These additional recommendations can be divided into three general areas as follows:

1. Development of career guidance information on occupations in Navy, responsive to the requirements, and consistent with the principles, of career education.

2. Development of curriculum materials and approaches for involvement of the Navy in direct support of career education programs.

3. Development of new liaison procedures which will increase the number and significance of Navy contacts with other federal, state, and local government agencies and private organizations involved in, or supporting, career education in public school systems.

Career Guidance Information

Revision of U.S. Navy Career Opportunity Descriptions. Guidance activities in programs of career education provide a large number of opportunities for the Navy to furnish career information. Most important in this regard is the capability of the Navy to build on its current career descriptions to produce new materials that will fulfill all the requirements of career education guidance programs. In this way, the Navy, or employment opportunities in the Navy, will become the subject of school placement activities (grades 11 and 12) and guidance activities (grades K-12 and beyond). When this occurs, educators will be describing Navy opportunities as part of America's work rather than separate from it.

Based on a review of career education programs and career development literature, ORI suggests specifications for the Navy career education guidance materials. Although the materials described are intended for use by 15 to 18-year-olds in the career exploration and career preparation stages of career education programs, the materials suggested include sufficient information to enable local school personnel to adopt the materials for use in the lower grades. Current progress in career education indicates that efforts have already been undertaken to adapt civilian opportunity descriptions for use at the elementary level.

Clustering Systems. As discussed in Section III of this report, career information is being presented to career education students in the context of career clusters or career families. This practice is intended to provide students with a broad perspective on the functional groupings of, and interrelationships among, all occupations. As discussed, a variety of career clustering systems are in use, and are being developed at this time. To facilitate both the use and the understanding of the career information materials that the Navy would produce, ORI recommends that each Navy career description contain a reference to its most appropriate location in each of the major career clustering systems (i.e., the 15 USOE Career Clusters; the Career Information System clusters developed at Ohio State University for the school-based career education model; the Dictionary of Occupational Titles; the Vocational Education and Occupations categories). Most school systems are, or will be, using one of these clustering systems, or a classification system of their own which is based upon one of these systems. The Navy, therefore, should relate its careers to all of these major clustering systems, to facilitate integration of information into as many individual school programs as possible.

Field Testing. It is also recommended that before Navy career materials are distributed, they be tested by educators and guidance counselors. In this way, the materials can receive the approval of these professionals. An indication of such approval can then be printed on the materials, and should increase interest in them. Mr. Robert Jervis of the Anne Arundel County School System and Mr. Frank Burtnett of the National Career Information Center, American Personnel and Guidance Association, have expressed their interest in reviewing and field testing the materials. Tests and demonstrations in other locales would also increase the awareness, on the part of school systems, of the availability and quality of the Navy materials.

Professional Education. Navy career guidance materials, although they would be intended for use in grades K-12 and beyond, can perform another extremely important function for the Navy. The same materials can be sent to colleges and universities which train teachers and guidance counselors. This is an especially appropriate step, since the process by which student teachers and counselors learn to find and use career guidance materials usually involves practice with and criticism of actual materials. Thus, if the Navy provided career information materials to teacher and counselor education centers, the students there, who will soon become active centers of influence in their work, would become familiar with Navy opportunities. This idea was suggested by Mr. George Russ, Director of Vocational Teacher Education and Certification, New Jersey Department of Education. Mr. Russ is an Officer in the U.S. Naval Reserve and formerly served in the Bureau of Naval Personnel. The Navy Recruiting Command has already begun activities which embody similar thinking in the Educator Orientation Visits, and in a project with the University of Delaware.

Several other educators emphasized the necessity for introducing Navy (and other military) career information into teacher and counselor training programs, among them Ms. Mary Allen of the American Vocational Association, Dr. Lee Burchinal, Assistant Commissioner of Education, National Center for Educational Communication, and Dr. Robert Worthington, Assistant Commissioner of Education, Bureau of Adult, Vocational and Technical Education, USOE.

Specifications for Career Information Materials.[1]

Style. The style used in the *United States Navy Occupational Handbook*, Sixth Edition, Bureau of Naval Personnel, Washington, D.C. (RAD 71115), dated 1 May 1971, would be appropriate. The style should be devoid of recruiting flavor.

Structure. A separate 3-hole punched folder, or several loose-leaf pages on each Enlisted Rating would be appropriate. The entire collection of loose leaves or folders might be bound in a vinyl loose-leaf binder entitled "Career Opportunities." Some benefit may be gained by not identifying the Navy on the front of the binder and by selecting a binder which is larger than is necessary for the Navy materials alone. This will encourage the use of the binder for non-Navy as well as Navy materials, and encourage the integration of the Navy and non-Navy opportunities.

The bound folders or leaves should be divided by tabbed index pages which bear the names of the USOE career clusters in which the Navy occupations are located.

Format and Content.

1. The title of the rating should appear in the center of the upper half of the first page and in the upper right corner of succeeding pages.

2. The upper right-hand corner of the first page, or the area immediately below the title, should bear a notation similar to the following:

   The career opportunities contained in this brief will conform with careers included in

   USOE Career Education Cluster
   (Title of Cluster)
   DOT Cluster (Number and Title of Cluster)

---

[1]An annotated example of materials that could be developed using these specifications appears in Appendix C to this report.

USOE Vocational Education and Occupations (Title of Area)[2]
USOE School-Based Model Cluster (Title of Cluster).

3. The ratings should then be described in a manner similar to that currently used in the *United States Navy Occupational Handbook* (Careers), with the following modifications:

   a. The heading, "Your Navy Career Vocational Brief," should be replaced. "The Occupation" would be an example of an appropriate heading.

   b. The new heading should be followed by a listing of important Naval Enlisted Classifications within the rating described, with brief descriptions of each.

   c. Duties and Responsibilities--as current, but revised to clarify nautical terms.

   d. Examples of jobs performed, as current, but revised to clarify nautical terms.

   e. Examples of skills and knowledge acquired, as current, but revised to clarify nautical terms.

   f. Place of work--as current.

   g. Qualifications and Preparation--as current, but expanded to link desirable school courses to Navy work and Navy training.

   h. Training Provided--as current, but expanded to indicate the criteria for selection for appropriate Navy schools, where a rating requires Navy schools attendance.

   i. Opportunities for Advancement--using the *Manual of Qualifications for Advancement* (NAVPERS 18068C dated June 1971), as changed, the career pattern should be displayed for each rating.

---

[2]If USOE aligns the Vocational Education and Occupations Areas with the 15 Career Education Clusters, as discussed in Section III of this report, it will probably not be necessary for the Navy to cite this clustering system in its materials.

[It is important to note in the Career Brief that the general ratings are achieved only following service in the general rates (apprenticeships). If this is stated, then each career education student can see clearly that he serves apprenticeship at the E-2 and E-3 levels in one of the seven general rates which are not as specialized as the general ratings. This will assure that no confusion exists in the minds of students concerning their position at the entry level in the Navy. It will also clarify the path of advancement and the dependence of advancement on achievements during service as Seaman Apprentice and Seaman.

The first part of the career advancement description should describe basic training; what it involves, why it exists, why it is given in a "total immersion" format.

The advancement pattern should then show a probable development beginning with a general rate as Seaman Recruit, Seaman Apprentice, and Seaman. The concept of striking for a general rating should be explained to show that the Navy has specifically provided for advancement through achievement and performance. Probable alternative periods of working and schooling from Seaman Recruit to Master Chief Petty Officer should be depicted.[3]

Also included in information concerning opportunities for advancement should be pay at all rates up to Master Chief Petty Officer. ORI believes, however, that the presentation of base pay, in the absence of estimated values of allowances and payments in kind, can reinforce misperceptions of the Navy as an employer offering wages below current market levels. The valuation of the total Navy remuneration package in terms that make it comparable with civilian pay scales is difficult because the Navy pay structure allows for variable payment based on the specific circumstances of each individual (e.g., grade, number of dependents, marital status, etc.). Nevertheless, ORI believes that if Navy opportunities are to be viewed as truly comparable to civilian options, some reflection of total remuneration is essential. The Navy should consider (or reconsider) development of a workable means of presenting estimates of total remuneration in career opportunity materials.]

---

[3]Such detail concerning advancement was probably not required in the past because of the relative lack of attention given by educators to work and career development. Within the career education context, however, teachers, counselors, and students will demand increasingly detailed information on *all* career opportunities.

j. Opportunities for Continued Career Development--This section should describe education and training opportunities in the Navy and educational entitlements of veterans.

k. Outlook--This section should state the average number of openings for additional men in the rating each year at the E-4 level. According to Mr. Robert Lehto, Special Assistant for Enlisted Plans, Bureau of Naval Personnel, the Navy has developed such estimates for each rating.

ℓ. Related Occupations--This paragraph should combine both "Related Naval Occupations" and "Related Civilian Jobs" without differentiating.

m. Sources of Additional Information--includes titles of Navy documents, available at recruiting offices, which provide more detailed information about the rating.

n. Environment--A separate loose-leaf sheet should be prepared on the environment for career pursuit in the Navy. This sheet should emphasize that although the Navy employs persons with virtually all types of talents and abilities, some persons will find the Navy environment for work more acceptable than others. In order to assist students in career education in deciding whether they would find the Navy environment acceptable, descriptive information that compares the Navy with civilian environments should be provided. This will further serve to correct certain common misperceptions of Navy service.

Again, it is important to understand that the Navy apparently differs from other employers primarily in its environmental aspects. To describe this difference to students is essential because these environmental aspects are often misunderstood, and often completely disguise the fact that the Navy is a working organization in which a large number of persons, with various specialties, do productive work.

An analysis of the Navy environment for work is a research topic in itself and is beyond the scope of this study. A descriptive outline of the topics which should be included in the loose leaf description of the Navy environment can, however, be suggested.[4]

---

[4]This outline includes subjects discussed by Donald E. Super, *The Psychology of Careers* (New York: Harper and Row), 1957, pp 8, 9, 11, 30-31, 116, 269, and 299. The same outline could be used to describe the environment for work in any organization.

The Navy environment for work consists of the physical and social context in which the work of the Navy is performed. The physical and social aspects of the Navy environment which are very different from civilian environments probably are different because of the Navy's mission and the Navy's knowledge of what is required to accomplish its mission. There are many other, less important differences (a traditional style of language, for example), which seem to be retained to give the Navy color and to help Navy personnel understand the heritage of the Navy as well as its current operations.

Of course, the differences between the Navy and civilian working environments probably do not submerge a much larger consensus of values and other cultural factors shared by Americans in both environments. Such a consensus seems likely, because all military personnel were once civilians. Most were educated by civilians and influenced by parents, friends, clergy, newspapers, and media entertainment in a civilian environment. Thus, a person entering the Navy will find Navy personnel and Navy life to be dissimilar to the civilian environment only in a limited number of ways, although some of the differences may be very significant. Most of the dissimilarities appear to ORI to be specifically connected with the context of Navy work.

In describing the characteristics of the Navy environment, suggested topics may include the following.

a. Mission-orientation. Since the requirements for mission achievement are changeable, Navy work is changeable, and all personnel must be ready to change roles as the mission requires.

b. Physical Conditions of Work. Under this category should come the multiple-duty concept which follows, partially, from the confined quarters aboard ships. A discussion of Navy requirements for personal physical fitness, neatness, and orderliness should also be included, as should a discussion of situations in which Navy life can be noisy, dirty, or dangerous.

c. Social Conditions of Work.

    1) What is the Navy system of Authority? What is the significance of the Uniform Code of Military Justice? Must unlawful orders be obeyed? Is arbitrary harassment of subordinates by superiors encouraged or discouraged? Is one's immediate superior approachable or held generally aloof?

    2) Is adjustment to coworkers difficult? Does Navy "management" help with this?

3) What kind of clothing is usually worn at work? What is the purpose of wearing uniform clothing?

4) Within the work situation, do fellow workers have a generally cooperative or generally competitive relationship to each other?

d. Work Routines.

1) What is the daily work schedule like? How does it affect one's personal schedule, including recreation time? How does it affect the lives of Navy personnel with families?

2) What is the seasonal variation in Navy work, ship-shore rotations, etc.?

3) What is the off-duty social life like? What are the restrictions on conduct? What conduct is encouraged? Is clothing style important while off-duty? What effect does mobility due to frequent transfers have on friendships, community involvement and community leadership?

Linking Rating Orientation Films to Career Education. Career education themes should be developed for the presentation of all Navy films that are shown in schools. Career education introductions, for example, should be written for the Rating Orientation Films developed as a joint effort by the Navy Recruiting Command and the Navy Training Command. Such introductions could be built into the sound track of the film and could mention the relationships of the subject rating to various career clusters to which the viewer may have been exposed in public school career education. The script could also be modified to show that Navy work and training is both the culmination of previous experiences and a preparation for future work and training both within the Navy and without.

A lower cost option would be to structure, in career education terms, the narrative introduction and/or ending of each film. These narratives could be read when the films are shown, rather than inserted into the sound track. Naturally, it is recommended that any additional films that are produced should relate the value of the subject rating to the total career education of an individual.

Use of the career education approach in films developed or distributed by the Navy was discussed with Mr. Charles Hammond, Executive Director, Naval Education and Training Support Center, Pacific. Mr. Hammond agreed that the career education approach would magnify the relevance and, therefore, utility of the films.

Evaluation and Publication of Career Development Experience of Veterans. The Navy should compile and release data on the post-discharge employment records of Navy veterans. Analyses should be performed to show

the frequency with which Navy veterans obtain civilian jobs for which they received training in the Navy. An analysis of this type would verify that Navy training, education, and experience is valuable to an individual's career development even if he or she leaves the Navy. This would show, in quantitative terms, the importance of the Navy role in individual career education. Such an analysis was suggested by Dr. Robert Worthington of USOE.

An additional dimension of an analysis of this subject was suggested by Mr. Peter Muirhead, Executive Deputy Commissioner of Education. In an interview with ORI, Mr. Muirhead clearly indicated his support for the concept of integration of Navy (military) information into career education, and suggested that additional attention should be directed to the process of transition from the Navy into career education programs. In discussing the concept of a logical "flow" of individuals from career education into the Navy, and after Navy experience, returning to continuing career education, Mr. Muirhead stated that approaches to aid individuals in this transition could be developed by the Navy in conjunction with the education community.

Linking ASVAB To Career Education. The career education programs should increase the interest of school systems in participation in the Armed Services Vocational Aptitude Battery (ASVAB) testing programs. Therefore, the ASVAB program, which has recently come under the executive supervision of the U.S. Air Force, should be undertaken in a way that clearly relates the value of ASVAB to the national career education movement.

The educational value of ASVAB will be enhanced by augmenting recruiting staffs with classifiers who are skilled at interpreting not only ASVAB but other aptitude and interest inventory tests as well. The services of Navy classifiers could assist school guidance personnel.

The importance of ASVAB to career education was demonstrated to ORI by Mr. Robert Turney of the Plans Division, Office of the Assistant Chief of Naval Personnel for Plans and Programs. Mr. Turney pointed out that ASVAB, *per se*, is an excellent example of the schools and the Navy working together for their mutual benefit and the benefit of students.

Linking Navy Education and Training Information to Career Education. While it is important to establish the concept of the Navy as a working environment in which an individual can pursue his specific career interest, it is equally important to establish the concept of Navy education and training as an integral part of an individual's career education overall. This means that the value of Navy education and training to an individual's career in the Navy environment, as well as in the civilian working environment, must be clearly expressed; the extent to which Navy education and training prepares students for careers in any environment must be understood.

ORI discussed this concept at length with Dr. Cleveland Bradner, Executive Staff, Chief of Naval Training.[5] Dr. Bradner strongly supports an approach to closely interrelating occupational, training, and education information. He indicated that just as Navy career descriptions should include information showing parallels between Navy jobs and comparable civilian jobs, descriptions of Navy education and training programs should show parallels with civilian education and training programs with which students are probably more familiar. Dr. Bradner concurs with ORI that Navy education and training information should also be described in such a way that a student can visualize and plan for a smooth transition from the career education program in which currently involved, to the Navy education and training program which will provide a logical extension of career education in his or her area of interest.

For these reasons, ORI recommends that materials describing Navy education and training opportunities be developed and distributed to schools, accompanying and supporting the career information distributed to schools.

Specifications for Information on Education and Training.

Style. The education and training opportunities in the Navy should be described in the same terms used by community and junior colleges, four-year colleges and universities, and vocational-technical schools in their program catalogs.

Structure. Loose leaves or folder.

Format and Content. While the format chosen for description of Navy education and training programs should also be consistent with that used by other post-secondary institutions, the Navy material should be organized around the career education clusters of occupations, as previously described. This would facilitate the use of the materials by guidance counselors and teachers who wish to relate Navy education and training opportunities to specific areas of student career interest. The upper right-hand corner of each page, therefore, should bear a notation such as "Navy Education and Training Programs in (name of appropriate career cluster)."

Descriptive materials should contain definitions of, and differences between, education programs and training programs. For all

---

[5]Dr. Bradner has been involved in the CNT development of the Navy Campus for Achievement, an effort which will provide accredited education programs to personnel within the Navy. This effort will lend visibility to the fact that Navy education opportunities are comparable to traditional civilian opportunities. Student perception of this comparability should increase appreciation of the potential educational benefits that accompany Navy employment.

occupations, sequence of education and training programs available or required should be illustrated. For each Navy occupation, amount of education and training available from each appropriate Navy or Department of Defense school, expressed in terms of credit hours or classroom hours comparable to civilian institutions, should be provided. Credentials granted by the Navy, comparable to or the same as civilian credentials, should be identified.

Descriptions of programs available through the Naval Academy, Officer Candidate School, Naval ROTC, Post-Graduate School, and through arrangements with colleges and universities should be included. Off-duty education and training opportunities should be described, as should current educational entitlements of veterans.

Development of Guidance Materials--General Observations. Following are observations that ORI obtained during the study from various persons contacted in the U.S. Office of Education. While worthy of note, they are *not* included here as specific recommendations.

1. Navy career education materials should accurately represent the role of women in the Navy and the policies related to the changing role of women. Review of career opportunities for women is an important aspect of career education. This was suggested by many educators, but was first recommended by Ms. Debbie May of Columbia University, a summer intern at USOE.

2. Navy career education guidance materials should identify all opportunities which may exist for persons with limited physical handicaps. This was also suggested by Ms. May and by Dr. Paul Manchak of the Bureau of Educational Personnel Development, USOE.

3. Navy career education materials should cite the importance of physical fitness in working for the Navy. This was suggested by Mr. Frank Perazolli of the Bureau of Educational Personnel Development, USOE.

4. Navy materials should identify the Navy's need for leadership ability and management skill, among both officer and enlisted personnel. At the same time, the Navy should describe career opportunities for persons who are less oriented to human relations but skilled in various technical fields. This was also suggested by Mr. Frank Perazolli.

5. Several educators also wished to encourage the Navy to continue ongoing efforts to change internally. Educators acknowledge initiatives by the Navy to increase

equality of opportunity, and to recognize individual needs through liberalized administrative procedures, housing arrangements, and personal appearance standards. Efforts to eliminate *unnecessary* malassignment and to professionalize service by reducing KP and clean-up details were also recognized as positive.

With specific regard to career development, it was suggested that the Navy continue to consider new procedures which would ease entry and exit from Navy employment. Raising the upper age limit for enlistment was suggested as was the establishment of an annuity basis for retirement pay. The desirability of change in these conditions of employment in the Navy was expressed specifically by Mr. William Dennis and Mr. David Pritchard of the Bureau of Adult, Vocational and Technical Education, USOE.

Materials and Approaches for Direct Support of Career Education

Development of Curriculum Materials Based on Work in Navy. To increase the probability that Navy career opportunities will be integrated into career education curriculum and presented to students in career education classroom activities, the Navy should consider developing and distributing curriculum materials which incorporate examples of Navy work into classroom learning exercises.[6] In addition to their value to students, such materials could actually serve to develop classroom teachers' understanding of the infusion of career information into academic subject matter. Well-developed career education curriculum materials would serve not only to present to students examples of the use of school subjects in work in the Navy environment, but would also provide teachers with models which could be followed in their development of materials using examples of other kinds of work in other environments. Navy development of curriculum materials, then, could serve to establish or reinforce the perception among educators that the Navy is a potentially valuable partner in career education.

The scope of this effort by the Navy could range from development of a few selected examples of Navy tasks as they relate to selected academic subjects, to a fully-developed curriculum package which presents an example of a Navy job in each career cluster, related to a learning experience in each of the general school disciplines (i.e., English, science, mathematics, social studies, art), and geared to each grade level in the schools (K-12), as appropriate. ORI believes, however, that even a small number of curriculum examples of this type, if properly written, would be of value to career educators, and would accomplish the objectives of this recommendation.

---

[6]The Navy has already taken steps to make existing training materials more readily available to schools. Selected Navy training courses are now listed in *Abstracts of Instructional Materials in Vocational and Technical Education* (AIM), a publication of the Educational Resources Information Center (ERIC). This publication is widely circulated in the education community, and provides good visibility concerning the availability of Navy materials.

Specifications for Curriculum Materials.[7]

Style. Standard instructional style should be geared to the reading level at which the material is to be presented. References to Navy personnel titles should be explained in terms of comparable civilian counterparts. Nautical terms should be explained, translated or eliminated from current materials.

Structure. Loose leaves or folder.

Format and Content. To facilitate the integration of this material into classroom activities, each lesson should be contained on one page front and back if possible, and should indicate at the top of the page the appropriate subject area, the principle or concept involved in the lesson, the appropriate school level for the lesson, and the career cluster in which the Navy occupation example is found (based on the Navy rating for that occupation).

The curriculum materials should be given titles to reflect the substance of the training included, and the fact that this training is really used in the Navy. One such title, which would be useful for high school students, could be "Sonar--Its Use in the Navy." This could introduce the Navy's explanation of the principle of sonar as it is described to Navy personnel who are training to be Sonar Technicians (ST).

The content of the training materials should begin with a brief description of some of the duties of the rating for which the training is given. For example, the material might begin with the following:

> In the Navy, Sonar Technicians operate electronic underwater sound equipment to detect the presence, direction, and range of underwater and surface craft and other submerged objects. This requires knowledge of the physics of sound.

The material might then go on to explain ranging by sonar. The language used in Navy training manuals to explain this topic may be acceptable at the high school level or may need to be modified for use by students either directly or with explanation by a teacher.

A practical exercise in which the student can test his knowledge of the concept of ranging by sonar while filling the imagined role of Sonar Technician would also be helpful. This type of simulation is a common military training technique, although the example cited here is hypothetical.

---

[7]A prototype of materials that could be developed using these specifications is included in Appendix D to this report.

Mr. Clark Dobson of the Association for Supervision and Curriculum Development, an affiliate of the National Education Association, emphasized that the curriculum materials would be most effective if they were developed by Navy personnel in conjunction with local educators. Mr. Robert Jervis, of the Anne Arundel County, Maryland, career education program, volunteered to test the materials, as did Mr. Edwin Crawford, Director of Career Education in Prince George's County, Maryland.

Further, Dr. Larry Bailey, Principal Investigator in the Career Development for Children Project agreed that Navy work was part of the subject of his research and development efforts. He expressed interest in developing Navy-related curriculum materials which could be used at the K-8 grade levels.

Provision to Schools of Selected Navy Technical Training Films. The Navy should consider offering its technical training films for use in career education programs in the public schools. Since many of the current efforts in career education are based on utilization of all communication media, these films may be useful. ORI recommends, however, that the Navy select from catalog NAVAIR 10-1-77, certain of the best films that are related to job skills that can be clearly linked to the 15 USOE Career Clusters, and offer this selection to the schools for use at their request.

The importance of the schools taking the initiative to request the films is based on the fact that the use of films is not necessarily beneficial to learning if the teacher does not raise questions that the films answer. A film that is not properly integrated into the curriculum may be viewed by students as a recess from learning. If, on the other hand, a teacher has previewed a film and adapted the total classroom presentation to incorporate the film's content, a Navy film may contribute to the learning process.

Like the curriculum materials mentioned above, availability to schools of Navy technical training films should increase the probability that Navy careers will be included in learning units, and will reinforce the perception of the Navy as actively involved in career education.

Distribution of these films may also be helpful to colleges and universities involved in training teachers and guidance counselors.

The use of Navy films to support career education was suggested by Mr. Ward Brown, Navy Recruiting Command Support Department.

Mr. Frank Burtnett of the American Personnel and Guidance Association suggested that APGA review and approve the films before they are offered to the schools. Mr. Clark Dobson of the Association for Supervision and Curriculum Development also offered to review the films.

Navy Participation in Career Education as a Community Employment Resource. Traditional vocational and technical education programs in public high schools have historically relied upon public and private employers in their local communities for support in a variety of areas. Many schools utilize local businesses, institutions, and agencies as employers in various forms of cooperative work experience programs. Some programs link work experience to school programs; some do not. Some programs pay students for time on the job; some do not. Arrangements vary from one school to another and from one employer to another. Local employers are also called upon to support schools in other ways. Employers may be members of advisory committees determining the best mix of subjects for certain occupations; they may talk directly to students as part of school programs; they may supply technical advice and special equipment to school programs.

With the advent of the career education approach, successful school-community involvement is critical. At the career awareness, career exploration, and career preparation stages of career education, opportunities for interaction between students and employers, to meet a variety of objectives, must be developed by schools.

The Navy should consider participation in cooperative education and work experience components of career education programs. This would expose students directly to both occupations that exist in the Navy, and the environment in which Navy employees pursue their careers. This would also reinforce the concept, for both educators and students, of Navy involvement in career education.

Navy involvement in cooperative education and work experience programs would require administration and operational preparation on the part of Navy activities involved, and close coordination between Navy activities and schools. Facility security requirements must be considered, and occupations must be selected for which student involvement would not be disruptive.

The Navy can also support career education programs in areas in which no Naval installations are located. Because administrative and clerical programs in schools utilize cooperative programs extensively, any public facility in which Navy administrative functions are performed could be involved in a school program, or in a consortium of employers involved in a program. Mr. Robert Jervis of the Anne Arundel County, Maryland, school system indicated that the critical need for skill training materials and equipment for career education programs could also be addressed by the Navy. In areas where the Navy would be unable to provide cooperative education and work experience for students, the provision (loan) of technical training materials and equipment would be viewed by educators as an extremely valuable service to education.

Development, with Aerospace Education Foundation, of Complete Training Courses Based on Navy Materials. Several educators, including Dr. Lee Burchinal and Mr. Clark Dobson, suggested that the Navy might join with the Aerospace Education Foundation (related to the Air Force Association) to adapt entire Navy training courses for public school use.

ORI recommends that the Navy consider this option for the following reasons:

- The materials produced by the Aerospace Education Foundation were reviewed by ORI and were found to be of excellent quality, especially in the context of career education.

- Evaluations of the materials, done primarily in Utah, demonstrated they were of great value to the education process.

- A Foundation representative, Michael J. Nisos, Managing Director, expressed enthusiasm for the concept of integrating Navy and other military service careers into career education programs.

- Mr. Nisos indicated that he saw no reason why the Foundation could not expand its work to include training courses for occupations that are included in the Navy's working environment.

The courses now available through the Aerospace Education Foundation include the following:

Structural Engineering Assistant

Medical Service Fundamentals

Nurse's Aide

Automobile/Truck Mechanic

Food Inspector

Apprentice Carpenter

Aviation Maintenance.

Navy involvement with the Aerospace Education Foundation is recommended primarily because the Foundation has already established the mechanisms required for development, production, and distribution of training materials. Educators familiar with the Foundation suggested that training materials representative of all services could probably be handled well by the Foundation. If the Navy were to consider establishment of its own mechanism to develop training packages for schools, the extent to which the Navy efforts would duplicate the existing Foundation capability, and the cost-benefit implications of a separate Navy effort, would require examination.

Expansion of Navy Liaisons with Agencies Interested in Career Education

The size of the Navy and the number of Navy installations and activities nationwide provide numerous opportunities for increasing the intercourse between the Navy and other agencies and individuals interested and involved in career education.

All of the efforts to increase Navy liaison with career education should continually reemphasize the two major themes of this report. First, the Navy (and the other service branches) are *employers* of persons with many different skills, and differ from other employers only in terms of the *environment* in which they work. Although this environment will not match the career interests of every citizen, many citizens, with a wide variety of career specializations, can and do find excellent opportunities for their own personal and career development in the military environment.

Second, the Navy should stress the importance of Navy service, of whatever duration, as *a positive component of the total career education process*. The training and work experience achieved in the Navy can be a logical extension of career education activities which precede Navy service. At the same time, Navy experiences can be viewed as preparation for further education and work in the Navy or in civilian life. Certain aspects of the Navy, such as veterans educational entitlements, enhance this aspect of Navy service.

Based on those two themes, the conclusion of all persons and agencies involved must be that the Navy is a part of American society and American work, and as such, it must be included as an integral part of career education.

Failure to include Navy opportunities could limit both the perspective of the individual career education student, and the success of society in providing for national security in an all-volunteer mode. On that basis, professionals who are involved in career education, and were interviewed by ORI, unanimously agreed that the Navy is a necessary part of the total career education effort.[8]

Educators interviewed during this study emphasized repeatedly that the Navy's approach to career education must focus on local school systems. Education, especially innovative education, has been and continues to be a public service that intentionally reflects local diversity. The kind and quality of planning, operation and support of the public school systems are dependent, to a very large extent, upon programs and agencies in state and local governments, and upon participation of private citizens. The importance of this local orientation of public education magnifies the significance of the following recommendations.

---

[8]The impact of the AVF on career guidance in public education was described in the October issue of *Inform*, a monthly publication of the National Career Information Center, American Personnel and Guidance Association. This article, written by ORI during this study, is contained in Appendix E to this report.

Recruiter Training and Support. Perhaps the most direct way to implement a Navy approach to career education is to provide recruiters with training concerning basic principles of career guidance and the nuances which the career education program add to career guidance. Thorough training of recruiters in these subjects is probably beyond the time and budget constraints of the Navy. Some training, however, if well designed, could probably be given in short, concentrated programs, and be beneficial to recruiters in their relationships with students and educators.

Of course, the career education guidance and curriculum materials described earlier in this section will provide recruiters with valuable support in their attempts to "talk the language" of career education.

Reorientation of Recruiting Materials. In addition to modifying recruiter training, the Navy should consider revision of several publications that are currently used in recruiting offices. ORI found that recruiters have some printed sources that describe the Navy's historical role in the career development of many citizens. Some of these materials encourage recruiters to demonstrate this role to school personnel. Other recruiting manuals require major revision (or elimination) if rapport between schools and recruiters is to improve.

From a list of publications that Main Recruiting Stations are required to maintain, ORI selected those with apparent pertinence to recruiting approaches to schools. These materials were reviewed to identify those which, in their present form, conform with career education concepts, and others which could be revised by the Navy if a career education effort is undertaken.

The Main Station materials reviewed include the following:

1. Advancement of Rating of Enlisted Personnel on Active Duty (NAVPERS 15989)

2. Personnel Procurement - Armed Forces Examining and Entrance (AR-601-270)

3. Bureau of Naval Personnel Manual (NAVPERS 15791B)

4. Naval Air Technical Command Bulletin of Schools and Courses (CNATT-P-5)

5. Career Counseling Guide (NAVPERS 15878B) - obsolete

6. Educational Services Manual (NAVPERS 16963E)

7. Enlisted Transfer Manual (NAVPERS 15909B)

8. Enlisted and Officer Conversion Tables (DOD 1313.1E/1313.1-0)

9. Guide for Approaching Schools, Second Revision (Pers - Rld)

10. Formal Schools Catalog, Bureau of Naval Personnel (NAVPERS 91769-G)

11. List of Training Manuals and Correspondence Courses (NAVPERS 10061 series)

12. Navy Officer Careers Handbook (RAD 72143)

13. The Science and Art of Navy Recruiting (NAVPERS 15940)

14. U.S. Navy Occupational Handbook (RAD 68134)

15. U.S. Navy Recruiting Manual (NAVPERS 15838A)

16. U.S. Navy Leadership Manual (NAVPERS 15934A)

17. U.S. Navy Public Affairs Manual (NAVSO P-1035)

18. Naval Academy Catalog

19. Practical Handbook for Recruiters (RAD-68141)

20. Enlisted Minority Recruitment Guide (NAVPERS 15152 Series)

21. Employing the Minority Group College Graduate, Robert Calvert, Jr.

In reviewing the materials listed, ORI found that some of the publications were considered obsolete or "not frequently used" by the Main Station personnel. Others, although in use, did not relate either directly or indirectly to any career education issues. The following comments concern those which are sometimes used and which may affect a recruiter's approach to schools which are implementing a career education or career development program.

The *Guide for Approaching Schools*, Second Revision, should be updated to inform recruiters of the fact that career education developments may be occurring in their localities.

The *Enlisted and Officer Conversion Tables* (as well as the *Military-Civilian Job Comparability Manual* cited earlier in this report) are useful to a potential recruit in the career education context.

The *Formal Schools Catalog* (used in conjunction with the *Manual of Qualifications for Advancement* cited earlier in this report) could be used as a source for effective presentations to guidance counselors and teachers who are involved in career education development.

The *List of Training Manuals and Correspondence Courses* may become more useful in the future as larger numbers of potential recruits learn career development principles in the public schools.

The *Navy Officer Careers Handbook* is useful as *recruiting material* in a career education context. ORI recommends, however, that separate career development guidance booklets be developed for the officer career fields, and used not in recruiting, but in actual career education activities.

These booklets for the officer specialties should be designed in a manner which is similar to that suggested for enlisted ratings (as previously described in this section). Without in-depth analysis of the 1800 officer occupations mentioned in the *Officer Handbook*, no reasonable suggestion concerning the appropriate number of these officer booklets can be made. Integration with civilian opportunity descriptions would be encouraged, however, if the Navy prepared 15 separate booklets describing officer opportunities in each of the 15 USOE Career Clusters.

As with the materials on enlisted ratings, any such guidance materials should be devoid of recruiting flavor.

The *Science and Art of Navy Recruiting*, although considered by some recruiters to be obsolete, was reported to be in use by others. ORI reviewed Chapter 17 of that document, entitled "Liaison with Schools." This chapter requires complete rewriting if any recruiter wishes to use it as a guide for approaching schools that are involved in career education. This is understandable, because this manual was published in 1963, before either AVF or career education were major issues.

The *U.S. Navy Occupational Handbook* should continue to be very useful as *recruiting material* in the career education context, although clarification of the nautical terms used would be useful. With some exceptions, it includes all elements of career education thinking and could be revised as a recruiting version of the career guidance materials described earlier in this section.

Four specific deficiencies of the *Handbook* should be reconsidered:

1. It does not describe recruit training experiences.

2. It does not describe the *work* of Navy personnel as Seaman Apprentice or Seaman.

3. It does not provide a salary schedule related to promotions, nor does it state the probable economic value of housing and services provided in-kind or supported by allowances. Because of allowances for dependents, and variations by rate, a statement of probable value is admittedly difficult. Because *total* Navy pay has risen so rapidly, inclusion of pay and allowance schedules may correct many outmoded perceptions.

4. It emphasizes, in the introduction, training and education opportunities to a much greater extent than *work* opportunities.

The first two of these criticisms are made regardless of the existence of career education. Omitting a description of recruit training and service at the E-2 and E-3 levels may raise doubts in the minds of perceptive potential recruits. Worse, perhaps, is the possibility that an enlistee, during his first year in service, may recall that the *Occupational Handbook* said nothing about the duties of apprentices and seamen which he found to be unexpectedly difficult.

Criticisms 3 and 4 are important, probably, only in the career education sense. Career salary schedules, and the attractiveness of making distinct contributions through work, will probably not become of great interest to students until the principles and practices of career education are widespread.

The *U.S. Navy Leadership Manual* could be used by public schools to prepare materials on the work significance of courses in human relations, government and citizenship.

The *Naval Academy Catalog* could be revised to describe Academy study as an excellent continuation of career education, and the prelude to additional excellent career experience as a Navy Officer.

In visiting a Recruiting Main Station, ORI found an additional publication, a memorandum entitled "Minority Recruiting for Enlisted Programs." On page 6 of that document is the statement that "The recruiter is there [in an interview with a member of a minority group] to offer an outstanding alternative to the minority male in his quest for a successful career." In the context of AVF, and career education, ORI suggests that this statement be reconsidered. It would probably be more accurate to say that the Navy provides outstanding career alternatives to many people in all groups of the population.

The development of guidance and curriculum materials and the reorientation of Navy recruiter training and recruiting publications would establish a career development focus. Reinforcement of that focus could be supported by other efforts which are described in the following paragraphs.

Modification of Educator Orientation Visits. This program of the Navy Recruiting Command brings large numbers of educators and students to major Navy training centers, to familiarize them with Navy training and work opportunities. This program is, literally, a direct Navy linkage to career education. ORI recommends, however, that these visits be conducted within a theme that specifically emphasizes the Navy's role in career education for those persons who see work in the Navy as conducive to their own career development. In discussions with CDR John Brame and CDR James High of the Navy Recruiting Command, this suggested approach was extremely well received and approved as a useful modification to the program.

ORI estimates that review and revision of the Educator Orientation Visit program to incorporate a career education theme, and orientation of Navy personnel to the theme, would require a low level of effort on the Navy's part.

Expansion of University of Delaware Project. Discussion of opportunities for pursuit of careers in the military can occur within guidance counselor preparation courses, and can also focus on the career education concept. Because career education is based upon many principles learned in such courses, they provide an atmosphere which is highly appropriate for the discussion of career opportunities in the military services.

The Navy has already recognized the potential value of the course on military opportunities at the University of Delaware (at Newark). Infusion of a career education presentation into such a discussion, or even adoption of career education as a theme for the entire course, would be a welcome development from the viewpoint of the Navy and the education and guidance communities as well. The University of Delaware course would provide an excellent opportunity for testing this concept with both students and professors of education. Success of such a test might suggest replication at other universities.

The costs of integrating a career education approach into a university-level discussion of career opportunities in the armed forces would be limited to the cost of consulting with the cognizant professors, if the career education guidance materials (as previously described in this report) were developed and were available for use. Without such materials, an additional low level of effort would be required to prepare the background materials and explanations needed to create a career education context for the presentation of Navy career information.

It must be noted here that staff development in career education programs is a major task in the career education movement. Consequently, many experienced teachers and counselors, as well as those who are training for those positions, are participating in college level programs to develop their own skills at teaching and counseling within the career education context. The presence of quality Navy materials and/or articulate Navy spokesmen in these courses would expedite diffusion of the perception of the Navy as both employer and partner in career education.

Navy Reserve Involvement. Navy reserve units can open their meetings and activities, as appropriate, to junior and senior high school students who have not enlisted in the Navy Reserve. This practice would constitute, from the educators' viewpoint, *career exploration*, if the students were allowed to observe and participate in the work of the Navy Reserve. It is important to emphasize that students who attempt such exploration should *not* be subjected to recruiting pressure. Rather, they should be allowed to learn from Navy reservists whatever they wish to know about Navy career specializations and the Navy environment for work. If this type of exploratory learning is allowed, the students will carry this learning back to their schools where further interest in the Navy may

develop. Again, a reserve program related to career education would help to establish the Navy both as a clear employment option for the young and as a community resource in the career education effort.

The cost of such a reserve effort could vary within a low cost range, depending on the extent to which local reserve units wished to support the effort. The initial step, in which reserve commanders express their interest in career education to local school officials, would be virtually cost free. Again such an offer would be facilitated greatly if the rationale of career education and the guidance materials previously described were readily available to local reserve commanders.

The role of the Navy Reserve in career education was of specific interest to Dr. Robert Worthington, Assistant Commissioner of Education, Bureau of Adult, Vocational and Technical Education, USOE. The Navy Recruiting Command has also recognized the potential of reservists in providing support for recruiting efforts in the schools. Navy reserve contacts with the public schools must be coordinated, of course, with other Navy contacts with the schools.

Involvement of Navy-Related Organizations. Members of Navy-related organizations such as the Navy League, the Fleet Reserve Association, and others, should also be encouraged to support career education programs. Since many members play active and important roles in business activity in the civilian sector, they are prime resources for providing career information and career exploration concerning their *current work* in civilian life. If, in this process, they could compare their current work with similar work or related training in the Navy, the Navy is again seen as an integral part of career development as well as an important segment of total American society.

Again, the cost of such an approach would consist, basically, of the time of the individual organization member. In addition, articles on career education and the Navy should be prepared for the Navy League's *Seapower* and the periodicals of other Navy-related organizations. Career education presentations to the conventions of these organizations should also be prepared and delivered. These activities concerning Navy-related organizations were discussed with, and deemed feasible by, CDR James High of the Navy Recruiting Command.

State Education Agency Liaison. The Navy should contact the Council of Chief State School Officers, to express Navy support for career education, and outline the importance of the Navy as a resource for career education. The Navy should also contact individual chief state school officers with a similar message. Included in these contacts, again, should be the rationale that the Navy is an employer and a significant partner in career education, and should, therefore, be included in any comprehensive career education program. Naturally, these messages should contain a description of any efforts, such as the Educator Orientation Visits, in which the Navy is already engaged in direct support of the state's education programs.

Orientation of Department of Defense High School News Service to Career Education. The DOD High School News Service, located at the Great Lakes Naval Training Center, offers the potential to emphasize the career education theme in its monthly magazine, entitled *Report*. Various issues of this magazine have already presented information of great value to the career education approach, but ORI could not identify any issue which specifically drew the attention of educators or students to the importance of the Navy (and other services) in career education.

ORI discussed the possibility of orienting *Report* presentations to career education with CDR Robert Sims of the Public Information Office, Department of the Navy. He agreed that couching descriptions of Navy careers in terms that are currently used in the schools increases the impact of the magazine.

A background package on career education, which would be adequate for use by the DOD High School News Service, could be developed at low cost. Periodic telephone consultations with writers at the News Service Office would probably be required thereafter.

Navy Liaison with Other Federal Government Agencies. As previously noted in the general findings and recommendations, educators and Office of the Secretary of Defense personnel, in addition to Office of Naval Research and Navy Recruiting Command personnel, recognized the need for a four-service effort to establish linkages with career education programs. Especially interested in this issue were the following:

- Dr. Lee Burchinal, Assistant Commissioner of Education, National Center for Educational Communication, USOE
- Dr. Robert Worthington, Associate Commissioner of Education, Bureau of Adult, Vocational, and Technical Education, USOE
- Mr. Frank Burtnett, Director, National Career Information Center, American Personnel and Guidance Association
- Dr. Richard Rose, Deputy Assistant Secretary of Defense (Education), OASD (M&RA)
- Mr. Frank McKernan, Director of Training Programs, OASD (M&RA)
- Dr. Ralph Canter, Director, Manpower Research, OASD (M&RA - MR&U)
- LTC Philip S. Hurd, Office of Director of Procurement Policy, OASD (M&RA)

Having recognized the necessity for eventual four-service involvement in a coordinated effort to establish liaisons between the Department of Defense and other agencies interested in career education, ORI recommends that the Navy encourage and stimulate such a coordinated effort. At this point in time, having initiated development of the military-career education concept, the Navy would assume the role of "opinion leader" in the process of stimulating coordination. The liaisons which the Navy could establish with other agencies, as described in the paragraphs which follow, will, in addition to meeting Navy-career education objectives, encourage this four-service coordination.

Career Education Development Task Force, National Institute of Education (NIE). The development of the four major career education models, as described in Section III of this report, is being managed by the Career Education Development Task Force within NIE. The Director, Dr. Corrinne Rieder, and the Deputy Director, Mr. Thomas Israel, indicated the desire of the Task Force to integrate Navy and other military information into the models, and requested that the information developed for this purpose be channeled through the Task Force for review and forwarding to the appropriate model development personnel at the local level. Implementation of a Navy-career education approach should involve an ongoing Navy liaison with this Task Force. (The specific ways in which the Navy can support each of the four major career education models is discussed in detail later in this section of the report.)

At such time that the Navy initiates an approach to career education, the Career Education Development Task Force and the key OSD personnel previously identified should be so advised. Since both educators and OSD personnel contacted have suggested a coordinated four-service approach to educational liaison, and since the Navy, through the Office of Naval Research, is the only service to have examined the potential of career education in depth, initiation of action by the Navy could motivate both the education community and OSD to actively support a coordinated effort.

Career Cluster Development Task Force, Bureau of Adult, Vocational and Technical Education, U.S. Office of Education. The Navy should offer to integrate its career opportunities into the appropriate USOE career clusters. Examples of relationships between Navy ratings and career clusters were presented in Section II of this report; the USOE career clusters were described in Section III. ORI verified with responsible USOE personnel that inclusion of *all* Navy ratings within the public service career cluster would disguise the diversity of the Navy's work and reinforce the misperception of the Navy as providing only the opportunity for the vague, undifferentiated employment opportunity referred to as "military career." Moreover, inclusion of the entire range of Navy opportunities within the public service cluster would be logically inconsistent with the limited number of nonmilitary opportunities which are included in that cluster, as developed to date. These include opportunities in government administration, police service, fire safety, law, etc.--all of which are only *part* of the diverse activities of the Navy. Of course, those opportunities for Navy work in the fields covered by the public service cluster should be considered in that cluster. All other Navy opportunities should be included in the other 14 clusters as developed by USOE.

Explicit support for ORI's suggestion of including Navy opportunities *across* the 15 clusters rather than *within* public service came from the following three educators who are involved in career cluster development:

- Dr. James Wykle, Education Specialist at USOE, who has responsibility for supervising the development of the public service cluster.
- Dr. Patrick Weagraff, Department of Education, State of California, who has contracted with USOE to develop the public service cluster.
- Mr. William Dennis, Education Specialist at USOE, who has responsibility for supervising development of the construction cluster.

Once again, initiation of such development efforts by the Navy could serve to stimulate a demand for similar efforts by other services.

National Advisory Council on Vocational Education (NACVE). The NACVE is composed of 21 representatives from labor, management and education. Members are appointed by the President, advise the Commissioner of Education on the operations of vocational education programs, and submit annual reports on vocational education issues to the Secretary of Health, Education, and Welfare. The Executive Director of NACVE, Dr. Calvin Dellefield, has indicated the interest of NACVE in the subject of Navy (military) integration into career education throughout this study. He indicated that NACVE members are currently involved in examination of several facets of potential interaction between the military and the education and employment community. In February 1972, NAVCE published a special report entitled *Employment Problems of the Vietnam Veteran*. NACVE is interested in the capability of the military to provide fully accredited education programs for its personnel, and is encouraging the use of military training materials in the public schools.

The Navy should maintain a liaison with the NACVE in regard to any Navy career education approaches. Council members are well established in their respective professional communities, would be able to advise the Navy on career education development, and would contribute to the diffusion of the concept of Navy integration into career education.

Federal Interagency Committee on Education (FICE). The FICE is administered by the U.S. Office of Education, with membership consisting of representatives of all federal agencies, including the Office of the Assistant Secretary of Defense (M&RA). Commissioner of Education Sidney Marland serves as the Chairman of the Committee.

FICE is intended to introduce concepts of coordination in education among agencies, and to facilitate that coordination at higher levels in the agencies. FICE operates on a project basis to a large extent, with subcommittees formed to pursue selected subjects of interest. The Director of FICE, Mr. Bernard Michael, indicated that Navy integration into career education would be an appropriate subject for FICE to examine. He suggested that FICE would be a useful avenue for coordination of this effort among the Departments of Defense, Labor, and Health, Education, and Welfare.

The Navy should inform FICE of any decisions to undertake a career education approach. FICE members would be able to enlist the support of their respective agencies in the cooperative efforts that would be required for successful Navy integration into career education.

U.S. Department of Labor (DOL). Several educators pointed to the need for coordination between the Department of the Navy and the Department of Labor in this effort. Mr. Bernard Michael, Director of the Federal Interagency Committee on Education, clearly indicated that a Navy-DOL liaison would be required to achieve full Navy integration into career guidance information. Members of the education and guidance professions, especially those involved in career education, use various Department of Labor documents as a basis for development of career guidance materials. The most important of these documents are the *Occupational Outlook Handbook* and the *Occupational Outlook Quarterly*. A recent copy of the *Handbook* (1970-1971 edition) contained 804 pages of descriptions of occupations. All but 2 pages, entitled "Armed Forces," are specifically devoted to "civilian" opportunities. This effectively submerges the fact that of the approximately 260 occupations described in the *Handbook*, the Navy has *training and work* in Navy Enlisted Classifications (NEC) and Navy Officer Billet Classifications (NOBC) which are clearly related to over half of those occupations.

The impact of this *Handbook* structure is probably significant. The *Handbook* is reputed to be "the bible" for most guidance professionals. The omission of the armed forces from all but two of its pages is transmitted through the entire career guidance community. Publishers of commercial guidance materials, who build upon and elaborate *Handbook* presentations, accept its standards. (Of an entire library of over 400 "career briefs" of one publisher who follows the standards set by the *Handbook*, only one was found that described military opportunities. It was entitled "Armed Services Careers.")

These observations are intended to point out that the historical practice of important and influential guidance material producers does not contribute to the perception of the Navy as an employer which, as has been put forth in this report, may be an essential ingredient for the continued success of AVF. Again, ORI believes that the Navy can rectify this situation by offering to work with the Department of Labor to integrate Navy opportunities, by specialization, into appropriate descriptions in the *Handbook*, and into appropriate discussions in the *Occupational Outlook Quarterly*.

ORI discussed integration of the Navy into a wider range of career specialization descriptions in the *Handbook* with Dr. Neal Rosenthal, Assistant Chief, Division of Manpower and Occupational Outlook, Bureau of Labor Statistics, DOL. Dr. Rosenthal indicated his willingness to meet with the Navy to discuss integration of civilian and Navy careers in the *Handbook*. He stated that, while military training opportunities were included in the DOL career information publications, additional integration of employment opportunities could be accomplished. He clearly indicated that DOL should work closely with the Navy and the other military branches, to eliminate unnecessary duplication of effort in the transfer of information. This, again, suggests the need for consideration of four-service coordination in supplying career information to the education and employment community.

It should be noted that Navy liaison with DOL in this career information effort could also lead to the integration of Navy occupations into the Dictionary of Occupational Titles (DOT) which, as has been discussed in Section III of this report, is a career clustering system of major significance for education and employment.

Office of the Secretary of Defense. In completing the present study, ORI and ONR participated in initial efforts to coordinate the research and development activities of Department of Defense organizations relative to career education. Although ONR was the only organization that had contracted to study this subject, OSD was considering funding of two other studies related to schools.

The first study involved integrating (ASVAB) test results and selected military skills into the 15 Career Clusters defined by USOE, and developing and producing actual working materials which will present this relationship to students, high school guidance counselors, other faculty members, parents, and recruiters. These materials were to assist guidance counselors in explaining USOE's career education concept, and lead to better working relationships between guidance counselors and recruiters.

The second study involved surveying and studying interactions between recruiters and high school guidance counselors, leading to development of a set of guidelines to maximize the effectiveness of recruiters and recruiting material in the interaction process.

Even though these two studies were not yet funded, all parties involved were interested in avoiding overlap of responsibility and duplication of contacts with the same members of the education community.

Based on the results of interviews with educators, ORI recommends that the Navy encourage coordination of research and development efforts, since educators expressed a strong desire for avoiding repeated contacts that would do little more than cover with one service an issue that had already been settled with another. OSD, understandably, is concerned that if the services fail to coordinate their efforts, the good will of educators may be undermined to the detriment of all defense agencies.

Commercial Publishing Firms. Dr. Calvin Dellefield, Executive Director of the National Advisory Council on Vocational Education, indicated to ORI that commercial publishers of guidance materials would play an important role in fostering the integration of Navy careers into career education. These publishing firms reach a large number of schools, primarily by supplying career descriptions, separately or in sets.

ORI contacted two major commercial firms, Science Research Associates (SRA) of Chicago, Illinois, and Chronicle Guidance Publications of Moravia, New York and Falls Church, Virginia. Each of these firms reported that they currently provide information on Navy careers; however, the information that they currently make available *separates* Navy from civilian opportunities. Among several hundred career descriptions that they publish, only a small number mention military opportunities.[9]

Mr. Jack Lombard of SRA and Dr. Joseph Barber of Chronicle Guidance said that they could rewrite their occupational briefs and other materials to include Navy career opportunities. Their practices are amenable to such revision since they must revise their materials approximately every three years to account for changing conditions in the labor market. Each of these firms said they would accept, and adapt to their distinctive formats, any Navy materials that showed a valid relationship between specific Navy ratings, NECs or NOBCs, and any of the occupational specialties currently described in their materials.

ORI also selected for contact a public service organization, B'nai B'rith Vocational Service Bureau, Washington, D.C. A publisher of guidance materials and consultant to youth groups interested in vocational guidance, this organization also expressed willingness and interest in incorporating Navy career information into its presentations of various occupations. Ms. Fae Hoffman and Ms. Anne Garrett indicated that they continually revise materials to ensure currency with changes in labor market conditions.

The career education guidance materials that have been recommended for development by the Navy should be provided to publishers of commercial guidance materials. A further step, which ORI did not investigate, would involve Navy consultation with authors who are, or will be, preparing books to be used by career guidance professionals, to assure that the role of the Navy in career development and employment is represented.

---

[9]The National Career Information Center of the American Personnel and Guidance Association volunteered to review its library of career materials to identify the frequency of references to military career opportunities. Of this entire library, which is a clearinghouse for all major commercial and noncommercial sources of information, approximately a dozen materials mentioned the military, and these cited training opportunities rather than work opportunities.

Professional Education, Guidance, and Student Associations. The Navy Recruiting Command already participates in and supports activities of organizations such as the National Association of Secondary School Principals, the American Vocational Association, the National Education Association, the Vocational Industrial Clubs of America, and others. All of these organizations can rapidly diffuse the concept of the Navy's integration into career education. They may also serve as distributors of high quality Navy materials related to career education. The result of these activities should be the creation of a demand for additional Navy materials.

In discussions with Ms. Mary Allen of the American Vocational Association and Mr. Clark Dobson of the Association for Supervision and Curriculum Development, ORI determined that professional associations will release their mailing lists for the purposes of informing their members of new developments affecting their professions. The Navy may wish to discuss the use of these mailing lists with the professional groups with which it is associated.

The Navy Recruiting Command should also develop career education themes for its participation in the various conventions of these professional associations. Navy-related career education articles in the periodicals and journals of these organizations should also be considered.

POTENTIAL UTILITY OF NAVY CAREER MATERIALS IN CAREER EDUCATION MODELS

While the preceding paragraphs in this section have detailed the study findings and recommendations for integrating the Navy into the career education movement overall, the following paragraphs are intended to summarize the ways in which Navy support and materials that have been recommended could be utilized in the four major career education models. As described in Section III of this report, these models are being developed by several school districts and contractors across the country under the auspices of the National Institute of Education. While the development of these models represents only one dimension of career education research and development, the models do represent the major federal commitment to career education. The extent to which the four types of models will be replicated in other school districts and in other locales across the country will be determined, to a great extent, by the performance of the prototype models in their initial demonstrations.

The benefit to be realized by using Navy materials varies (for both the Navy and the models) across the four types of models. This variance is primarily a function of the appropriateness of Navy career information and training materials to the target population of each model. The characteristics and potential size of the target populations of the school-based model and the employer-based model suggest that Navy involvement in these models would be mutually beneficial. The value of Navy involvement in the home/community-based model could be somewhat lower for both the Navy and the model, due to the characteristics of the target population and the nature of the services provided by the model. Navy involvement in the rural residential model appears to be of little direct value at this time.

ORI has discussed the integration of Navy information into the models with cognizant personnel associated with each model. The ways in which the Navy can relate to each of these models may be summarized as follows. (See Section III of this report for detailed descriptions of components of these models.)

The School-Based Model

Curriculum Units. The training materials which could be developed by the Navy, linking Navy work to problems in various subject matter areas (as previously described in this section), could be utilized directly in the school-based model. These materials could be integrated into the curriculum materials which are included in each career education unit being developed for the model. Units are being developed for each grade level, K-12, and Navy materials would be infused at a level commensurate with the relative difficulty of the problems contained in the materials.

Navy career descriptions (as previously described in this section) would also be useful to the developers of the curriculum units for the model. If the Navy materials contained the level of detail that has been recommended, curriculum developers would be able to extract sufficient detail on work performed to relate examples of Navy jobs to classroom learning activities in various subject areas.

Career education units being developed for the model also contain kits of learning resources, including slides, tapes, films, etc. These resource kits could utilize Navy career orientation films that had been tailored to career education (as recommended earlier in this section), as well as Navy training materials in any form (e.g., films or programmed instruction packages).

Career Information System. The Navy career descriptions that would be developed as recommended earlier in this section would be suitable for use in the Career Information System (CIS) being developed as part of the school-based model. In order to integrate Navy occupations into the CIS, descriptions of those occupations must include information on what is done or produced (product), how the work is done through tasks (process), and the characteristics and traits, including interests, aptitudes, and educational development, of the worker (person). In addition to a good basic description of the occupation, information on temperament required, physical demands of work, subject knowledge required, general preparation requirements, basic economics of occupation, and methods of entry should be included.

Mr. Walter Adams, developer of the CIS, indicated that Navy information would be most usable if it related to the CIS clustering system (described in Section III of this report) rather that a military personnel classification system; if it identified civilian counterparts to the Navy occupations described; if it contained the product/process/person elements in the descriptions. The specifications for Navy career descriptions recommended by ORI would clearly meet all of the CIS requirements.

Community Relations. This component of the model seeks to involve community resources in the development and conduct of career education programs. Navy personnel, both active and reserve, who are living in the proximity of a career education program can support that program in a variety of ways. Both the Navy and the program can benefit through discussions of jobs performed in the Navy, and the Navy as a working environment, with educators, parents, and students; field trips covering Navy facilities; arrangements to provide materials and equipment useful to the program; and similar supportive activities.

Guidance. The guidance component of the model coordinates the provision of information on careers with the career education curriculum at each grade level. The guidance units that are being developed to accompany the curriculum units can utilize the same Navy career descriptions that would be used in the model's Career Information System, as described above. Navy career orientation films could also be used in the guidance component. In addition, Navy support for guidance could involve supplying sets of the ASVAB to those guidance personnel who wish to use ASVAB in their programs.

Placement. This component of the school-based model includes both job placement and post-secondary education placement. Career education program placement personnel can utilize many of the information items that would be contained in the recommended Navy career description material (e.g., current and projected demand for personnel by occupation, pay and benefit packages, entry procedures). Navy recruiting personnel, of course, can work directly with placement personnel to meet all information requirements that arise. The recommended career education orientation of recruiters would, obviously, aid in this relationship.

Navy education and training information, developed as recommended, would also be useful to placement personnel concerned with education placement. These materials would indicate the degree of comparability between Navy education and training and traditional civilian programs at the post-secondary level and thus broaden student understanding of available options.

The Employer-Based Model

Instructional Program. Instruction in the employer-based model takes place on employers' sites as well as in the central resource center located in each community. The model serves high school students, and the employers' role in this model focuses on student learning related to the occupational experience provided by the employers. The Navy can participate in the employer-based model as an employer. This can involve bringing students into Navy facilities on a regular schedule for varying periods of time, allowing students to observe Navy personnel at work, and allowing them to get "hands-on" experience in a variety of Navy occupations.

The employer-based model in Philadelphia, which ORI described in Section III of this report, identifies three types of required instruction: general (traditional secondary education), explorative (on-site study of work and life), and specialized (hands-on experience with jobs

and projects). While the Navy would be in a good position to provide some explorative education (helping students understand the physical and social aspects of living and working in the Navy environment), it would be in an excellent position to provide specialized education. The Navy could develop a program of student involvement with a number of selected jobs, coupling actual experience on each job with training in the skill areas required by the jobs. For many jobs, existing Navy training materials would be suitable. Other existing materials would be readily adaptable for this purpose. Extent of training provided would depend upon length of time on-site which would be scheduled for each student or group of students. Employer-based programs are flexible, depending upon the extent to which individual employers wish to become involved.

The Navy could support the instructional program at the central resource center of the employer-based model in the same manner as described above for support of the school-based model curriculum. That is, the Navy could provide training materials linking school subjects to Navy work, as well as other existing Navy training materials, including films and programmed instruction materials.

Student Personnel. This component of the employer-based model contains the student counseling function, which includes placement. Once again, the Navy can support this component of the model in the same manner as described above for the Career Information System, guidance, and placement components of the school-based model. That is, the Navy could provide the Navy career descriptions, developed as recommended; the Navy career orientation films prepared, as recommended, in the career education context; the Navy education and training information, for use in educational counseling; and sets of the ASVAB. Here again, Navy recruiting personnel can provide direct support to student personnel workers, especially if the recruiters are given the recommended career education orientation.

It should be noted that the employer-based model is currently being developed in Philadelphia, Pennsylvania, and Oakland, California. Major Navy installations are accessible to students in both of these model programs. (The Marine Corps has already established contact with the Philadelphia model.) The model is also being developed in Portland, Oregon, and Charleston, West Virginia. Navy and Marine Corps Reserve Training Centers are located in both Portland and Charleston, suggesting that some support could be provided to these model programs as well.

The Home/Community-Based Model

While the school and employer-based models serve the public school population, the home/community-based model is focused on retired persons and housewives who want to work, and 16 to 25-year-olds who have not settled on education or career plans. Navy support to this model would probably be intended to benefit this latter group.

The model does not provide instruction directly to the population; rather, it provides career education information and services through telephone counseling, mass media, and a resource center. The model seeks to identify promising careers for individuals and refer them to the training and education programs needed to undertake those careers. For this reason, all of the Navy materials suggested for the school and employer-based models, with the exception of the various Navy training materials, would be useful in this model. Especially useful for counseling and referral would be the recommended Navy career descriptions, and the recommended Navy education and training information. The resource center for the model could utilize the Navy career orientation films prepared in the career education context. Navy personnel, both active and reserve, living in the proximity of the resource center could support the center through involvement in the career discussions, conferences, workshops, and other activities held at the center.

The Rural Residential Model

Because this model is designed to serve a limited number of disadvantaged family units drawn from a rural region into a residential setting, the value to the Navy of involvement in this model is unclear at this time. The model is intended to prepare family members for job placement, primarily within the six-state region from which they were drawn. While Navy career descriptions, career orientation films, and education and training information would be of questionable value to this model, current Navy training materials-- films, etc.-- could be useful in the appropriate occupational areas for which training is being provided by the model.

SELECTED SIGNIFICANT RECOMMENDATION

It should be apparent that the potential significance to the Navy of all of the specific recommendations contained in this section of the report is not uniform. ORI has identified one of the recommended actions which appears to represent the cornerstone of the overall Navy-career education approach, and which impacts, in varying degrees, upon most of the other recommended actions.

In terms of both long and short-term potential for achieving broad community perception of the Navy as an employer having a working environment that is desirable for many people, and as a partner in the career education effort, the revision of Navy career opportunity information that can be used in a nonrecruiting approach to career education appears to be the most significant immediate action that the Navy can take. This information will enable educators to present Navy opportunities at the same time and in the same manner and context as all other opportunities for careers in a given skill specialization.

Furthermore, rewriting and repackaging of the Navy career descriptions, including development of information on the Navy as a working environment, and development of information on the role of the Navy in career education and career development, facilitates several other recommended actions in the following ways.

- Provides Navy recruiting personnel with a career education orientation, and equips recruiters with materials of value to the school personnel with whom they deal.

- Supports other Navy Recruiting Command initiatives, including Educator Orientation Visits and the University of Delaware Project; assists producers of Navy career orientation films in relating films to career education.

- Establishes new Navy liaisons with agencies and organizations involved in career education; supports career education and career development efforts of these agencies and organizations.

  - U.S. Office of Education, Career Cluster Development Task Force: Integration of Navy careers into 15 Career Clusters.

  - National Institute of Education, Career Education Development Task Force: Integration of Navy career information into career education models.

  - Department of Labor, Bureau of Labor Statistics, Division of Manpower and Occupational Outlook: Integration of Navy careers into *Occupational Outlook Handbook*. (Because this publication is relied upon so heavily in the career guidance and publishing communities, accomplishment of this action, in itself, must be considered a significant goal for the Navy.)

  - Professional and student associations in the education community: Diffusion of Navy-career education concept.

  - Career guidance materials publishers: Integration of Navy careers into standard packages of career information.

- Provides career education curriculum developers with sufficient detail to enable them to integrate Navy occupations into classroom materials.

- Provides Navy Reserve personnel and Navy-related organizations with a career education orientation, and with materials that facilitate their involvement in career education efforts.

- Precipitates the need for internal Navy coordination of operations, personnel, training, and recruiting functions, all of which contribute to the career education approach; precipitates the involvement of the Office of the Secretary of Defense in coordinating the career education efforts of the other service branches with the efforts of the Navy.

ORI does not intend to suggest that other recommendations, such as establishment of the Navy as a community resource for career education programs, and development of curriculum materials based on Navy work, are of little importance to the overall success of a Navy-career education approach. ORI believes that all recommendations will play a useful role in this Navy effort, and the Navy can begin to implement some of these recommendations before the career opportunity information is developed.

IMPLEMENTATION COST ESTIMATES

For any study that involves analysis of feasibility of actions and/or recommendations for appropriate actions to be undertaken, some consideration must be given to the costs that are attached to those actions. For each of the recommended actions previously described in this section of the report, therefore, ORI has developed estimates of costs that may be anticipated by the Navy for implementation.

For a number of reasons, these costs are expressed in terms of cost factors or cost category requirements, rather than in dollar amounts. The variance in salaries, as well as productivity, of the individuals who would implement the recommendations could not be foreseen by ORI. Also, the variance in materials production and distribution costs, which depend upon choice of in-house or contracted sources, as well as quantity and quality of the materials themselves, could not be estimated by ORI within the scope of this study.

The cost estimates developed, therefore, are presented for each action in terms of calendar time requirements, manpower requirements, material requirements, and travel requirements. Ongoing maintenance of actions recommended are not included in estimates. ORI believes that the requirements estimated for each of these categories are reasonable, based upon current research and development experience.

Cost category requirements are illustrated for each recommended activity in Table 4. In an effort to portray these estimates as clearly as possible, categories were subdivided into more detailed cost levels. The categories and levels used are described as follows.

Calendar Time Requirements

This category is expressed in terms of estimated calendar months required to perform the work entailed in the recommended action. This assumes work will not be performed as a "crash" effort involving intervention of authority to reassign manpower away from normal ongoing operations.

TABLE 5

COST REQUIREMENTS BY CATEGORY FOR RECOMMENDED ACTIONS

RECOMMENDED ACTIONS	CALENDAR MONTHS TO DEVELOP AND INITIATE	LABOR (MAN-MONTHS)			MATERIALS			TRAVEL		
		HIGH SALARY	MIDDLE SALARY	LOW SALARY	HIGH COST	MODERATE COST	LOW COST	LOCAL	MODERATE	EXTENSIVE
Research on Similarity Between Navy and Civilian Work Specialties	12	12	18	24			X		X	
Research to Develop Concept of Military Environment for Work	4	4	8	6			X		X	
Management Plan for Navy-wide Career Education Implementation	6	3	9	6			X		X	
Revision of U.S. Navy Career Opportunity Descriptions	9	9	27	27	X			X		
Linking Navy Rating Orientation Films to Career Education	Variation in technical factors involved in film-making techniques does not permit reasonable estimates to be made.									
Evaluation and Publication of Career Development Experience of Navy Veterans	12	8	12	12		X			X	
Linking ASVAB to Career Education	2	1	2	2		X			X	
Linking Navy Education and Training Information to Career Education	12	9	18	18	X				X	
Development of Curriculum Materials Based on Work in Navy	18	9	18	18	X			X		
Provision to Schools of Selected Navy Technical Training Films	3	1	3	1		X			X	
Navy Participation in Career Education as a Community Employment Resource	3	1	3	1			X		X	
	Costs reflect those involved in diffusion of concept within Navy. Costs of each school program would vary depending upon extent of Navy involvement.									
Development, with Aerospace Education Foundation, of Complete Training Courses Based on Navy Materials	12	6	12	12		X			X	
Recruiter Training and Support	3	3	3	3		X				X
Reorientation of Recruiting Materials	Volume and variety of materials does not permit reasonable estimates to be made.									
Modification of Educator Orientation Visits	2	1	1	1			X		X	
Expansion of University of Delaware Project	3	1	2	1			X			X
Navy Reserve Involvement	3	1	1	1			X			X
Involvement of Navy-Related Organizations	2	1	1	1			X		X	
State Education Agencies Liaison	3	1	1	1			X			X
Orientation of Department of Defense High School News Service to Career Education	2	1	1	1			X	X		
Liaison with Career Education Development Task Force	2	1	1				X	X		
Liaison with Career Cluster Development Task Force	4		6	2			X	X		
Liason with National Advisory Council on Vocational Education	1	1					X	X		
Liaison with Federal Interagency Committee on Education	1	1					X	X		
Liaison with U.S. Department of Labor (Revision of Occupational Outlook Handbook)	6	1	6	3			X	X		
Liaison with OSD	Initial liaison on this subject has been established with this study.									
Liaison with Commercial Publishing Firms	3		2	1			X			X
Liaison with Professional Education, Guidance and Student Associations	3	1	1	1			X			X

It also takes into account the "realities" of scheduling work involving other agencies and organizations.

Manpower Requirements

This category is expressed in terms of estimated man-months required to perform the work entailed in the recommended action. Three personnel salary levels are used for this estimate.

High Salary. This includes management, senior R&D, and supervisory personnel having responsibility for an overall effort.

Medium Salary. This includes administrative, R&D, and operating personnel assigned to specific analysis, development, or implementation tasks required within an overall effort.

Low Salary. This includes administrative, junior R&D, and operating personnel who support the tasks performed as research assistants or as clerical staff.

Material Requiments

This category is expressed in terms of estimated levels of costs associated with production, storage, and distribution of materials recommended for development. Three cost levels are used for this estimate.

High Cost. This includes materials intended for broad Navy distribution, such as guidance materials prepared for public secondary schools across the country.

Medium Cost. This includes materials intended for normal distribution within the Navy organization, such as Navy pamphlets on career education prepared for use at recruiting stations.

Low Cost. This includes materials required for normal communication, reporting, etc., concerning actions that do not involve Navy distribution of materials.

Travel Requirements

This category is expressed in terms of estimated amount of travel associated with the tasks required by the recommended action. Three levels of travel time are used for this estimate.

Local Travel. This includes travel within the immediate area in which the recommended action is undertaken.

Moderate Air Travel. This includes travel outside the area in which the recommended action is undertaken for purposes of research and development.

Extensive Air Travel. This includes travel outside the area in which the recommended action is undertaken for purposes of implementation.

APPENDICES

A: Education Authorities Interviewed

B: DOD Personnel Interviewed

C: Example of Occupational Material for Career Education

D: Prototype of Navy Career Education Curriculum Material

E: Article From *Inform*, National Career Information Center's Monthly Newsletter

APPENDIX A

NAMES AND AFFILIATIONS OF EDUCATION AUTHORITIES INTERVIEWED

Mr. Peter Muirhead, Executive Deputy Commissioner
USOE

Dr. Lee Burchinal, Assistant Commissioner of Education
National Center for Educational Communication
USOE

Dr. Robert Worthington, Assistant Commissioner of Education
Bureau of Adult, Vocational and Technical Education (BAVTE)
USOE

Dr. Otto Legg, Deputy Director
Division of Vocational and Technical Education
BAVTE, USOE

Dr. Sidney High, Chief, Program Development and Operations Branch
Division of Vocational and Technical Education
BAVTE, USOE

Members of BAVTE committees and task forces involved in career education:

Mr. J. Bates Johnson
Mr. William A. Dennis
Dr. James Wykle
Ms. Iris Bailey
Mr. David Pritchard
Mr. William Burnt
Ms. Debbie May
Mr. John McCarthy
Mr. Louis Anderson

Members of the Career Education Development Task Force, National Institute of Education:

Dr. Corrinne Rieder, Director
Mr. Thomas Israel, Deputy Director

Dr. Lance Hodes, Program Manager
Employer-Based Career Education Model Development

Ms. Ella Johnston
Education Program Specialist
Coordinator of Home/Community-Based Career
Education Model Development

Dr. David Hampson, Project Director
School-Based Career Education Model Development

Dr. Harold Johnson
National Institute of Education Coordinator
Rural Residential Career Education Model Development
Denver, Colorado

Dr. Paul Manchak, Chief
Career Education Personnel Development Branch
USOE

Mr. Frank Perazolli
Career Education Personnel Development Branch
USOE

Dr. Calvin Dellefield, Executive Director
National Advisory Council on Vocational Education
Washington, D.C.

Mr. Bernard Michael, Director
Federal Interagency Commission on Education
USOE

Comprehensive Career Education Model
The Center for Vocational and Technical Education
Ohio State University
Columbus, Ohio

Dr. Aaron J. Miller
Mr. Walter Adams
Dr. Bruce Reinhart

Ms. Juliet Brudney
Career Education Project Director
Home/Community-Based Model
Education Development Center
Newton, Massachusetts

Dr. Larry Bailey, Principal Investigator
Career Development for Children Project
Southern Illinois University
Carbondale, Illinois

Mr. George Russ, Director
Vocational Teacher Education and Certification
New Jersey State Department of Education
Trenton, N. J.

Mr. Monty Multanen, Coordinator
Career Program Operations
Oregon State Board of Education
Portland, Oregon

Dr. Patrick Weagraff
Division of Public Service Occupations
California State Department of Education
Sacramento, California

Mr. Robert Jervis, Coordinator
Career Education Implementation Team
Anne Arundel County Public Schools
Brooklyn Park High School
Baltimore, Maryland

Dr. Edwin Crawford, Career Education Director
Prince George's County Public Schools
Upper Marlboro, Maryland

Ms. Mary Allen, Legislative Liaison Director
American Vocational Association
Washington, D.C.

Mr. Frank Burtnett, Director
National Career Information Center
American Personnel and Guidance Association
Washington, D.C.

Mr. Clark Dobson, Associate Secretary
Association for Supervision and Curriculum Development
National Education Association
Washington, D.C.

Mr. Michael Nisos, Managing Director
Aerospace Education Foundation
Washington, D.C.

Dr. Joseph Barber, Research Director
Chronicle Guidance Publications
Falls Church, Virginia

Dr. Jack Lombard, Research Director
Science Research Associates
Chicago, Illinois

B'nai B'rith Vocational Service Bureau, Washington, D.C.

Ms. Fae Hoffman
Ms. Anne Garett

Dr. Neal Rosenthal, Assistant Chief
Division of Manpower and Occupational Outlook
Bureau of Labor Statistics
Department of Labor
Washington, D.C.

APPENDIX B

NAMES AND ORGANIZATIONS OF DEPARTMENT OF DEFENSE PERSONNEL INTERVIEWED

NAVY RECRUITING COMMAND

Captain W. J. Loggan, Plans Department
Captain Peter A. Stark, Support Department
CDR Robert Crawford, Support Department
CDR James High, Support Department
CDR John Brame, Support Department
Mr. Ward Brown, Support Department
CDR John Rodda, Recruiting Aids Department

BUREAU OF NAVAL PERSONNEL

Dr. J. F. Ballard, Manpower and Personnel Systems Research
Mr. Robert Turney, Active Enlisted Plans
Mr. Robert K. Lehto, Special Assistant for Enlisted Force Analysis

NAVY TRAINING COMMAND

Dr. Cleveland Bradner, Executive Staff
Chief of Naval Training

Mr. Charles Hammond, Executive Director
Naval Education and Training Support Center, Pacific

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE (MANPOWER AND RESERVE AFFAIRS)

Dr. Merle R. Rose, Deputy Assistant Secretary of Defense (Education)
Dr. Ralph Canter, Director of Manpower Research (MR&U)
Mr. Frank McKernan, Director of Training Programs
Lt. Col. Philip Hurd, All Volunteer Force Task Force

DEPARTMENT OF DEFENSE HIGH SCHOOL NEWS SERVICE

CDR Robert B. Sims
Department of the Navy Public Information Office

APPENDIX C

EXAMPLE OF OCCUPATIONAL MATERIAL FOR CAREER EDUCATION

The following suggestions for content of Navy occupational briefs apply to the specifications for revision of Navy career opportunity materials contained in Section IV of this report, and use the description of Boatswain's Mate as currently contained in the *United States Navy Occupational Handbook* as the foundation for further development. (Sections taken from the *Handbook* appear in italics.) In most instances, the suggestions call for simple revision of existing information. Examples of new information that could be drawn from other existing Navy sources are cited.

BOATSWAIN'S MATE

The career opportunities contained in this brief will conform with careers included in:

- USOE Career Cluster--Transportation
- DOT Occupational Group 911--Water Transportation Occupations
- Vocational Education and Occupations--17.0801,02--Seamanship, Ship and Boat Operation and Maintenance
- USOE School-Based Model Cluster--Transportation and Communication.

As explained in Section IV of this report, these career cluster descriptors should be included to assist users in schools in relating this Navy Rating to the appropriate cluster in the career clustering system they are using. (If USOE merges the Vocational Education and Occupations system into the USOE career clusters, as mentioned in Section III, there will be no need to indicate the appropriate Vocational Education and Occupations areas in the Navy material.)

YOUR NAVY CAREER VOCATIONAL BRIEF

The Navy develops master seamen--persons skilled in all phases of seamanship and in the handling of deck personnel. They are the masters of many trades, able to perform almost any task connected with the operation of small boats, navigation, entering or leaving port, storing cargo, handling ropes and lines. These master seamen are the Boatswain's [pronounced Bōs-n's] Mates.

The title of this paragraph should be changed. "Your" should be eliminated because it implies a direct approach to the student reader which may be construed by teachers and counselors as having recruiting overtones. "Career" is an incorrect description, in the career education context. A Navy Rating is, instead, an occupation. "Vocational" should be eliminated because it may be misconstrued as limiting the appeal of the Rating to those students who participate in specifically occupational courses. A simple title such as "The Occupation" would serve to introduce this description.

With the addition of an aid to the pronounciation of Boatswain, the paragraph text provides an appropriate introduction to this Navy occupation.

It would also be useful, as part of this introduction, to indicate the variety of individual positions that are filled within the Boatswain's Mate Rating. While the listing of selected NECs, such as Tugmaster, Yard Craft Boat Captain, Minesweeper Boat Captain, Assault Boat Coxswain, and Landing Craft Captain, would enable the reader to visualize some of the specific positions filled by Boatswain's Mates, brief descriptions of the type and function of the boats involved, as well as the meaning of the terms "master," "captain," and "coxswain" in this context, should be included. This information would aid both students and educators who are unfamiliar with the Navy in understanding the positions listed.

Duties and Responsibilities

A large number of miscellaneous duties distinguish the work of Boatswain's Mates. They direct the handling and storage of mooring lines, anchor gear, and cargo. They can take their turn at the wheel or double as gun captains. They can use signal flags and lights to communicate with other ships or the shore. They direct boat crews in landing or rescue operations. They supervise the deck crew in cleaning and painting the ship and in the preservation of the ship's hull and superstructure. They can tie any knot and sew canvas. Boatswain's Mates are often given duties as tug captains, captains of oil barges, or masters of other yard and district craft. On shore stations they are usually the petty officers who command personnel in military drill, instruct them in seamanship, direct shore patrol activities, and maintain order.

The information contained in this paragraph is appropriate for career education purposes. Of course, if selected NECs are described above this paragraph, the listing of these positions or duties again within this paragraph would be redundant. In any event, terms such as "mooring lines," "gun captains," "canvas" (how it is used, why it is sewn), "yard craft," "district craft," and "petty officer" should be explained or defined for readers.

Examples of Jobs Performed--

1. *Material upkeep: Store, preserve, and use ropes, cordage, wire, canvas, leather, and paint. Make boat fenders, cargo nets, hatch and boat covers. Adjust and operate sewing machines. Prepare surfaces for painting; select, prepare, and use different kinds of paints for deck, machinery, and camouflage painting.*

2. *Deck seamanship: Operate and maintain ship's boats, winches, and deck machinery. Serve as steersman and determine position by plotting bearings. Prepare rigging for all purposes such as hoisting, towing or being towed, and fueling at sea. Install, read, and care for boat compasses. Direct launching, stowing, repacking, and use of inflatable lifeboats and equipment.*

3. *Cargo: Supervise loading, unloading, and stowing of cargo. Operate derricks, cranes, winches, lift trucks, and other equipment used in the handling of cargo.*

4. *Ship maintenance: Preserve and care for ships including painting and cleaning, repairing deck equipment, and overhauling anchor chains.*

5. *Gunnery: Act as gun captains and take charge of casualty drills.*

6. *Boat operators: Act as yard craft or harbor tug captain and as coxswain of small boats. Pilot small boats making use of charts, compasses, and other navigation aids.*

7. *Amphibious: Perform duties involved in amphibious landings such as preparation for beaching and retracting of landing craft; operate bow doors, ramps, and anchors during landing and retracting; launch, assemble, and operate pontoon barges.*

The information contained in this paragraph is also useful for career education purposes. Here again, however, the need for clarification of some terms is evident.

- Under material upkeep, "cordage, wire, canvas, leather" should be described in terms of its use on various craft. "Boat fenders" should be described.

- Under deck seamanship, the terms "ship's boats," "steersman," "plotting bearings," and "stowing" should be explained.

- The third heading, "cargo," should be expanded to "cargo handling" for consistency with other job headings.

- Under ship maintenance, the work involved in "overhauling" anchor chain could be explained.

- Under gunnery, the work of "gun captains" could be explained, as could the work involved in conducting "casualty drills."

- The heading "boat operators" should be changed to "boat operation" for consistency. Most terms under this heading will have been previously explained.

- The heading "amphibious" should be expanded to "amphibious operation" for consistency. The term "retracting" should be revised or explained, and "pontoon barges" could be described.

Examples of Skills and Knowledge Acquired--

1. *Principles of piloting and navigation.*

2. *General duties of a boat coxswain including signals to powerboat engineer, knowledge of classes, and capacities of boats and equipment carried by regular ship's powerboats.*

3. *International and Inland Rules of the Road for using lights and whistle signals under certain conditions.*

4. *Elementary principles of fire control including control of a gun or mount, estimating target range, pointing, training, and spotting.*

5. *Methods of maneuvering in a restricted place; effects of propellers, rudder, wind, and current on small craft underway and going alongside.*

6. *Storm indications, storm warning signals, and other methods of obtaining weather information.*

7. *Methods and principles of camouflage painting.*

8. *Methods of cargo handling and general rules for stowage of cargo and equipment.*

9. *Methods of rigging for towing boats, ships, barges and airplanes; methods of salvage operation.*

10. *Safety precautions to be observed in handling cargo, ammunition, and flammables; in operating winches, boats, and deck machinery.*

Again, the information contained in this paragraph, while appropriate for career education, would be more useful if the meaning of certain terms was clarified. Terms requiring clarification include the following.

- Under 2, all terms.
- Under 3, "International and Inland Rules of the Road."
- Under 4, "fire control," "pointing," "training," "spotting."
- Under 5, "going alongside."

Place of Work

Boatswain's Mates are on all types of ships and at nearly all shore stations. At sea, their duties usually keep them on deck or on the bridge.

In this paragraph, the "bridge" should be explained in terms of its function as a ship command center.

Qualifications and Preparation

An important qualification for Boatswain's Mates is leadership. Boatswain's Mates must be physically strong with good hearing and vision. Boatswain's Mates should be average or above in general learning ability and possess a high degree of manual dexterity.

A school course in practical arithmetic is highly desirable and courses in algebra, geometry, and physics are helpful. Experience in handling small boats is valuable.

This paragraph should not require modification for inclusion in career education material. It would be desirable, however, to expand upon the relationship of the reader's career education program or courses to the jobs performed by Boatswain's Mates, and to the training provided by the Navy, as described in the next paragraph.

Training Provided

Upon entering the Navy, all personnel are sent to a Recruit Training Command for basic training, guidance, and classification. Upon completion of this period, training for Boatswain's Mate is begun by performing regular duties under the supervision of experienced personnel. In addition to this on-the-job instruction, formal training consists of individual, guided study of appropriate training courses and other publications. Training will include:

1. *Operation of powerboats*
2. *Marlinspike and deck seamanship*
3. *Gunnery*
4. *Care and use of cordage, wire, canvas, and leather*
5. *General ship maintenance and repair*
6. *Installation, care, and use of the compass*
7. *Handling of ground tackle*
8. *Principles of piloting, navigation, and cargo handling*
9. *Principles of weather*
10. *Methods of salvage operation*
11. *Supervisory experience through increasing responsibilities in the direction of personnel.*

Here again, Navy terms that have not yet been explained, e.g., "marlinspike seamanship," and "ground tackle," should be explained in this paragraph.

In addition, more information on the relationship between an individual's education and training prior to Navy employment, and the types of training provided by the Navy, would be useful in a career education context. In Section IV of this report, the development of materials describing Navy education and training programs is discussed. These materials, which would link public school career education to Navy education and training and Navy work, would be used in conjunction with the materials describing Navy occupations.

Opportunities for Advancement

As part of the description of each Navy occupation, a discussion of the typical pattern of advancement from entry level would be a useful aid for students and educators in better understanding Navy employment. Following is an example of the kind of information that could be included for Boatswain's Mate. Note that base pay figures are used in this example in the absence of information on the value of Navy benefits, allowances, etc. As discussed in Section IV of this report, information on the total value of the Navy remuneration package would be useful here.

Advancement as a Boatswain's Mate follows a continual pattern of learning and working. Promotions are determined by time in grade, quality of work, examination marks, and demonstrated ability. The Navy's system of promotion is unique in one respect: an individual does not fail to advance simply because he or she is assigned to a ship or station which does not require another person in the next higher pay grade. So if an individual qualifies for advancement through the Navy's servicewide competitive examinations, advancement will follow.

Promotions in the Navy, as in the other military service branches and many large civilian organizations, occur within a relatively fixed pattern which reflects the level of skills and responsibilities of the employees.

When an individual enters the Navy, he or she is designated a Seaman Recruit during Recruit (Basic) Training, and earns a salary at pay grade E-1, currently $288 a month. (Housing and certain other needs are provided and are not paid for out of an individual's base pay.)

Recruit Training is a short, intensive, rigorous school in which all Navy personnel prepare physically, intellectually, and emotionally for their work in the Navy. This training is an unprecedented experience for most recruits, for it reflects the Navy environment for work, which is designed to make the Navy an efficient team, capable of achieving its mission at all times, even under the pressures of combat. Recruit training teaches all sailors the methods used by the Navy to assure this team efficiency, and some aspects of the training are designed to simulate the physical and emotional stresses of dangerous Navy operations. As a result, Navy Recruit Training is very difficult and challenging and involves all of the most important issues that affect living and working in the Navy.

After Recruit Training, persons who are seeking to become Boatswain's Mates begin their special training. At this point they have become Seaman Apprentices, and earn the base pay of grade E-2, currently $320 a month.

As is true of apprenticeships in many other career fields, the work of a seaman apprentice consists primarily of "learning-through-helping." Apprentice seamen are responsible at first for much of the cleaning and maintenance of the ship or facility to which they are assigned. As the beginning seaman learns more about the operation of the vessel or facility,

he is assigned more often to duties outside of cleaning and maintenance, such as standing watches on deck, operating small boats, booms, cranes, and winches, and acting as a member of a gun crew or damage control party.

The rate of Seaman is reached after about 10 months of service and earns $333 base pay per month at grade E-3. A Seaman who wishes to become a Boatswain's Mate continues to perform maintenance duties and to stand watches, but also begins to qualify for the rating of Boatswain's Mate by demonstrating certain knowledge and abilities concerning safety, cargo handling, damage control, gunnery, ship handling, piloting and signaling, painting, deck seamanship, boat and amphibious seamanship, and administration.

A Seaman who is "striking" for, or learning to be, a Boatswain's Mate normally achieves his rating in about 16 months after beginning employment with the Navy.

Upon achieving the rating of Boatswain's Mate, an individual is first called a Boatswain's Mate Third Class, and earns an E-4 base pay, currently about $350 per month. At this level, the Boatswain's Mate performs relatively routine tasks of deck operations and maintenance. At the same time he learns more difficult tasks and can "strike" for, or learn the duties of, the next rank.

The next rank, Boatswain's Mate Second Class, is usually achieved after about 2-1/2 years of working for the Navy, and draws pay at the E-5 level--about $430 per month. Second Class Boatswain's Mates are responsible for the more difficult routine tasks concerning deck operations and maintenance.

After serving about 8 years in the Navy, a Boatswain's Mate normally can qualify for Boatswain's Mate First Class. Individuals holding this rank are responsible for extremely difficult tasks which require long experience and extensive training. A Boatswain's Mate First Class earns a base pay of grade E-6, about $540 per month. At this level, a Boatswain's Mate is often assigned to the supervision and training of junior personnel.

Twelve to 14 years after entering the Navy, a Boatswain's Mate may qualify to become a Chief Petty Officer. Boatswain's Mate Chief Petty Officers are heavily involved in supervision of deck and small boat operations and maintenance, and in the instruction and training of junior personnel. Chief Petty Officers also assume an expanded role as leaders (managers) responsible for the morale and productivity of the personnel they supervise. Chief Petty Officers earn base pay at the E-7 grade, currently about $650 per month.

A Boatswain's Mate Chief Petty Officer may advance to the rank of Senior Chief Petty Officer, who, as an expert in his specialty, plans and administers on-the-job training and other training programs for subordinates. A Senior Chief Petty Officer also serves, on occasion, outside of his rating in areas of leadership, administration, and supervision. Senior Chief Petty Officers earn salary at grade E-8, about $775 per month.

Boatswain's Mates of very high ability may advance to Master Chief Petty Officer providing senior-level enlisted supervision and administration to all personnel in the Boatswain's Mate rating in a command. The Master Chief Petty Officer is deeply involved in managerial and leadership tasks designed to ensure maximum efficiency of the personnel and equipment for which he is responsible. He is also expected to function outside of his specialty in other, more general administrative and supervisory capacities, as a senior enlisted advisor to the commander in matters concerning enlisted personnel.

Opportunities for Continued Career Development

Another area of information that would link Navy occupation descriptions to career education deals with opportunities for ongoing career development while employed by the Navy. Here again, the materials describing Navy education and training, which were discussed in Section IV of this report, would provide the basis for information on Navy support for individual career development.

Following is an example of the kind of information that could be included in each Navy occupation description.

All Navy personnel have access to correspondence schools which provide courses in a number of subjects related to each person's interests. The Navy is currently developing methods of making these courses and work experience in the Navy more meaningful for career advancement both within the Navy and within civilian work establishments. All Navy personnel are entitled to Veteran's Administration education benefits which can be used for tuition and other education expenses when an individual chooses to terminate his employment with the Navy.

Outlook

All public school personnel involved in career education and career guidance are concerned with information on the future potential for employment in all occupational areas. Projections of demand for employees by industry and occupation have always been sought by educators and counselors. In order to better link Navy materials to career education efforts, projections of demand for each occupation would be useful. As discussed in Section IV of this report, manpower projection data is currently available within the Navy for this purpose.

Related Naval Occupation

Aviation Boatswain's Mate (AB)

Related Civilian Jobs

Motorboat operator
Tugboat captain
Pier superintendent
Boatswain
Able seaman
Canvas worker
Rigger
Winchman

The above paragraph headings should be combined into a single heading. "Related Occupations" would serve well for this, in that it does not suggest that readers differentiate between related Navy occupations and civilian occupations. "Aviation Boatswain's Mate (AB)" should be changed to "Navy Aviation Boatswain's Mate" (the AB designation is not required here), and moved to replace "Boatswain" in the current listing of occupations.

Sources of Additional Information

A reference to sources of additional information on duties attached to each rating would be useful for students and career guidance personnel, and would encourage contacts between public school students and personnel and the Navy. A statement such as the following would probably suffice.

"More detailed information on the work performed by Boatswain's Mates in the Navy is available in U.S. Navy documents such as the *Manual of Qualifications for Advancement*. This information, as well as additional information on placement and employment with the Navy, can be obtained by contacting local U.S. Navy representatives."

Navy Working Environment

As discussed in Section IV of this report, information describing the Navy environment for work should be added to existing information on the types of Navy work that is performed, i.e., the jobs and the job skills required. As has been discussed, the most important difference between work for the Navy and work for another employer in the civilian sector is not in the skill specializations required, which seem to be very similar in most instances, but rather in the environments in which these skill specializations are applied. For this reason, career educators and students could benefit from a description of the Navy environment in which all ratings are pursued. Some information on the Navy environment, as defined in Section IV, could be included as part of each Navy occupational description.

APPENDIX D

PROTOTYPE OF NAVY CAREER EDUCATION CURRICULUM MATERIAL

Subject: Physics/Electricity
Principle: Ohm's Law
Level: Senior High School
Career Clusters: Construction, Structural Work, Electrical Occupations, Communication

THE USE OF OHM'S LAW AND THE POWER RELATIONSHIP BY A CONSTRUCTION ELECTRICIAN

THE OCCUPATION[1]

Construction Electricians install, operate, maintain, and repair electrical generating equipment, distribution systems, transformers, switchboards, distribution panels, motors, inside wiring, and lighting fixtures. They erect and maintain power and communication lines, and install, operate, maintain, and repair communication equipment.

In the Navy, advanced bases require the construction of roads, barracks, airfields, hospitals, shops, and warehouses. Construction Electricians are responsible for all power production and electrical work essential to the establishment and operation of these bases. The work that Construction Electricians do for the Navy is very much like the work done by Powerhouse Electricians, Linemen, Electrical Repairmen, Substation Operators, Building Estimators, and Construction Electricians for civilian employers.

In the Navy, Construction Electricians are assigned to naval activities ashore and mobile construction battalions which rotate to overseas areas for construction and maintenance work. In the United States, they are assigned to primary or advanced construction schools, the naval construction center, amphibious bases, or other naval activities which have a particular need for their skills.

---

[1]For this prototype, the description of the work of the Construction Electrician is drawn directly from the description of this rating in the *United States Navy Occupational Handbook*.

Skills Required and Jobs Performed

Construction Electricians must have the skills and knowledge required to perform a variety of jobs for their employers. They must have studied mathematics and physics, and understand basic electrical theory, motors and generators, and communications systems. They must use testing equipment such as voltmeters, ammeters, and ohmmeters in checking circuits and equipment. They must also use electrical and communications hand tools, and power driven tools such as grinders, drills, and lathes.

Construction Electricians who work in the Navy are called upon to apply their skills and knowledge to:

- Install high and low voltage power lines, underground electrical systems, and communication systems. Erect poles, attach cross arms, string wires, install distribution panels and transformers. Splice and lay underground cables.

- Install, maintain, and repair public address and interoffice systems, and fire alarm systems.

- Install, maintain, and repair telephone switchboard systems. Lay out and install overhead, underwater, and underground telephone systems.

- Install, operate, and synchronize generators in parallel, service and repair generator equipment, and perform duties in powerhouse control rooms.

- Splice, install, and pull wire through conduits; lay out, install, maintain, and repair secondary electrical systems; install conduits.

- Locate and repair common failures of electrical systems such as grounds, short circuits, and open circuits; maintain and repair high and low voltage power lines; maintain and repair electrical equipment such as relays, solenoids, and switches.

- Check electrical systems and communication systems for conformity to specifications and plans.

- Diagnose, analyze, and prescribe remedies for electrical and communications failures.

- Install, repair, and charge storage batteries. Install and check dry cell batteries.

- Install, clean, lubricate, and make minor repairs to electrical motors. Wind, bake, and insulate armature and field coils.

- Install, maintain, and repair current and voltage transformers.

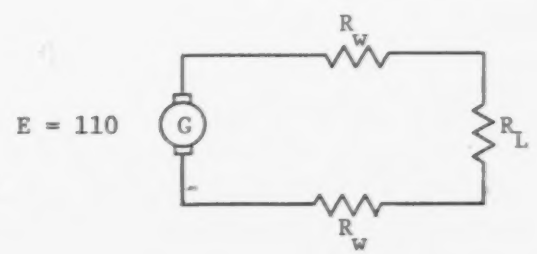
THE PROBLEM

One of the jobs that might be assigned to a Construction Electrician who works in the Navy would require that he install a portable electric heater for other workers at a construction site. A problem that he would have to solve in doing this job would involve determining the proper safe size wire to connect the portable heater to its power supply.

On this construction site, there is a portable generator which produces 110 volts of power. The heater, a resistance load, requires 1400 watts at 120 volts. The installation of the heater requires the use of 250 feet of extension cord. The Construction Electrician knows that No. 14 wire with a rubber coating has a maximum allowable current of 15 amperes and a resistance of 2.58 ohms per 1000 feet, and that No. 12 wire, with a rubber coating, has a maximum allowable current of 20 amperes and a resistance of 1.62 ohms per 1000 feet.

The Construction Electrician's approach to determining safe wire size in this situation would be as follows.

First he makes a sketch of the circuit involved. The construction site circuit looks like this



where R_w = resistance for *each* wire

R_L = resistance of the load

He knows that safe wire size is determined by the total current that must be maintained in the circuit, and that this current can be determined by applying *Ohm's law*, E = IR. To determine the total current--Ohm's law requires that he know the total resistance in the circuit--he performs the following operations.

First, he determines the resistance of the load, R_L. He recalls that P (power) = EI, so

$$P = 1400 \text{ watts} = 120 \times I$$

$$I = 11.7 \text{ amperes.}$$

From Ohm's law, then, the resistance of the load is

$$R_L = E/I = 120/11.7 = 10.3 \text{ ohms}$$

Next, he determines the resistance for each wire, R_w. If No. 14 wire, which is the smaller of the two wire sizes, is used,

$$R_w = 2.58 \text{ ohms}/1000 \text{ ft} \times 250 \text{ ft} = 0.65 \text{ ohms.}$$

For the construction site circuit, then, the total resistance is the sum of the individual resistances in the circuit, which is

$$2 R_w + R_L.$$

From Ohm's law, the total current in the circuit is

$$I = \frac{E}{R} = \frac{110}{2R_w + 10.3}$$

(This shows that as the resistance of the wire size increases, the total current flowing in the circuit decreases.)

Thus, the total current in the circuit for No. 14 wire is

$$I = \frac{110}{2(0.65) + 10.3} = \frac{110}{11.6} = 9.5 \text{ amperes}$$

The Construction Electrician compares this with the safe current of the wire. Since 9.5 amperes is much less than 15 amperes (the safe maximum of No. 14 wire), he knows No. 14 wire can be used safely in this situation.

The Question of Efficiency

Before making his final decision, however, the Construction Electrician might also consider the difference in operating efficiency for the two wire sizes he is considering.

He knows that the power used by the load is

$$P = I^2 R_L = (9.5)^2 (10.3) = 930 \text{ watts.}$$

Thus, he can see that in using No. 14 wire, efficiency is reduced to 2/3 of the design capability of the heater. To improve efficiency, that is, to get more power to the load, the Construction Electrician knows that he must increase the current (I) in the circuit, and that this is accomplished by decreasing the resistance of the wires.

Using No. 12 wire, the resistance is

R_w = 1.62 ohms/1000 ft x 250 ft = 0.41 ohms.

The total resistance in the circuit ($2 R_w + R_L$) is

2 (0.41) + 10.3 = 11.1 ohms.

The total current ($I = E/R$) is

I = 110/11.1 = 10 amperes.

The power ($P = I^2 R_L$) used by the load, then, is

$P = (10)^2 (10.3) = 1030$ watts.

The Construction Electrician sees from this that, to maintain higher efficiency, the No. 12 wire should be used. While the No. 14 wire will meet his safety requirements, he may choose to use the No. 12 wire if he believes that, for this construction situation, higher efficiency is important or justified.

Other Problems

As part of this job, the Construction Electrician may be called upon to solve many additional problems. For example, he may want to determine: The maximum possible power the load can draw (1180 watts); the voltage measured across the load if No. 14 wire is used (98 volts); the power lost in each wire if No. 14 wire is used (58 watts). All of these problems can be solved by the application of Ohm's law and the power relationship.

APPENDIX E

ARTICLE FROM *INFORM*, NATIONAL CAREER INFORMATION CENTER'S MONTHLY NEWSLETTER

A SERVICE OF THE AMERICAN PERSONNEL AND GUIDANCE ASSOCIATION

NATIONAL CAREER INFORMATION CENTER

INFORM

Volume 1, Number 3

October, 1972

THE IMPLICATIONS OF AN ALL VOLUNTEER FORCE (AVF) FOR CAREER GUIDANCE

Secretary of Defense Melvin Laird has recommended to President Nixon that the military draft not be extended beyond 1 July 1973. According to Mr. Laird, military service "hires" – on a completely voluntary basis – will probably be sufficient to fill military service manpower requirements. One significant implication of this recommendation, from the viewpoint of guidance professionals, is that the military services will be seeking 300,000 entry-level employees per year – and competing with other employers in the free market for human resources.

The military services have always employed great numbers of young people. The employment openings, however, were not career opportunities in a strict sense because, unlike jobs in civilian life, military jobs were affected, directly or indirectly, by the draft. The image of military jobs was also affected by the low pay and organizational inefficiency that accompanied the draft. Virtually all information concerning military occupations was presented to educators and students in the context of recruiting. Because military career opportunities were presented in a recruiting context, the credibility of the materials, and the opportunities as well, was highly suspect. Further, the guidance information that was utilized by professionals to present careers in the military environment was not keyed to skill or career specialization. Rather, counselors and guidance material publishers tended to view the military establishment as an undifferentiated whole, usually referred to as "military career."

With the inception of the All-Volunteer Force (AVF) policy, the time has come to consider what the military services may actually represent: a working environment in which individuals can pursue real career opportunities – on a fully voluntary basis.

Decisions concerning career development can be well-founded only if they are based on accurate perceptions of both career specializations and career environments. If we take the definition of career as the total of all employment experiences in an individual's life, it is easy to see that in each career several decisions can be made concerning career environment. An individual can pursue an entire career in a private sector environment, or in the civilian public service, or, perhaps, in the military environment. On the other hand, we are all familiar with individuals who pursued their careers successfully in several of these environments. The point is that decisions concerning the environment in which to work are probably as important to students, throughout their careers, as are decisions concerning career specialization.

Since the choice of career environment is important and must eventually be made, counselors should have the responsibility for assisting students in developing preferences not only for career specializations, but also for career environments. To accomplish this successfully, counselors must present information concerning the working environment options for each career specialization. Since almost all of the career specializations that exist in the military environment also exist in other environments, and since the selection of the military environment will now be completely voluntary, the integration of information on careers in all environments, for purposes of presentation to students, can now occur.

Career educators, including guidance professionals, will need to obtain more accurate information on all aspects of career opportunities in the military service and on the salient characteristics of the military working environment. Because most existing information on careers in the military does not lend itself to integration with information on comparable careers in the civilian environment, the military services have begun to investigate ways in which this integration can be facilitated. The Office of Naval Research has contracted with Operations Research Inc. of Silver Spring, Maryland to perform the first of these investigations.

IN THIS ISSUE

Around the World of Work Page 2
Kaleidoscope Page 3

DISTRIBUTION LIST

NAVY

4 Dr. Marshall J. Farr
Director, Personnel and Training Research Programs
Office of Naval Research
Arlington, Virginia 22217

1 Director
ONR Branch Office
495 Summer Street
Boston, Massachusetts 02210

1 Director
ONR Branch Office
1030 East Green Street
Pasadena, California 91101

1 Director
ONR Branch Office
536 South Clark Street
Chicago, Illinois 60605

1 Office of Naval Research
Area Office
207 West 24th Street
New York, New York 10011

6 Director
Naval Research Laboratory
Code 2627
Washington, D.C. 20390

12 Defense Documentation Center
Cameron Station, Building 5
5010 Duke Street
Alexandria, Virginia 22314

1 Chairman
Behavioral Science Department
Naval Command and Management Division
U.S. Naval Academy
Luce Hall
Annapolis, Maryland 21402

1 Chief of Naval Technical Training
Naval Air Station Memphis (75)
Millington, Tennessee 38054
ATTN: Dr. G.D. Mayo

1 Chief of Naval Training
Naval Air Station
Pensacola, Florida 32508
ATTN: CAPT. Allen E. McMichael

1 Chief
Bureau of Medicine and Surgery
Research Division (Code 713)
Department of the Navy
Washington, D.C. 20390

1 Commandant of the Marine Corps
(Code A01M)
Washington, D.C. 20380

1 Commander
Naval Air Systems Command
Navy Department, AIR-413C
Washington, D.C. 20360

1 Commander
Submarine Development Group Two
Fleet Post Office
New York, New York 09501

1 Commanding Officer
Naval Personnel and Training
Research Laboratory
San Diego, California 92152

1 Head, Personnel Measurement Staff
Capital Area Personnel Service
Office
Ballston Tower #2, Room 1204
801 N. Randolph Street
Arlington, Virginia 22203

1 COL. George Caridakis
Director, Office of Manpower
Utilization
Headquarters
Marine Corps (A01H) MCB
Quantico, Virginia 22134

1 Special Assistant for Research
and Studies
OASN (M&RA)
The Pentagon, Room 4E794
Washington, D.C. 20350

1 Mr. George N. Graine
Naval Ship Systems Command
(SHIPS 03H)
Department of the Navy
Washington, D.C. 20360

1 Chief
Bureau of Medicine and Surgery
Code 513
Washington, D.C. 20390

1 Program Coordinator
Bureau of Medicine and Surgery
(Code 71G)
Department of the Navy
Washington, D.C. 20390

1 Research Director, Code 06
Research and Evaluation
Department
U.S. Naval Examining Center
Building 2711 - Green Bay Area
Great Lakes, Illinois 60088
ATTN: C.S. Winiewicz

1 Superintendent
Naval Postgraduate School
Monterey, California 93940
ATTN: Library (Code 2124)

1 Technical Director
Naval Personnel Research and
Development Laboratory
Washington Navy Yard
Building 200
Washington, D.C. 20390

1 Technical Director
Personnel Research Division
Bureau of Naval Personnel
Washington, D.C. 20370

1 Technical Library (Pers-11B)
Bureau of Naval Personnel
Department of the Navy
Washington, D.C. 20360

1 Technical Library
Naval Ship Systems Command
National Center
Building 3, Room 3
S-08
Washington, D.C. 20360

1 CDR Richard L. Martin, USN
COMFAIRMIRAMAR F-14
NAS Miramar, California 92145

1 Mr. Lee Miller (AIR 413E)
Naval Air Systems Command
5600 Columbia Pike
Falls Church, Virginia 22042

1 Dr. James J. Regan
Code 55
Naval Training Device Center
Orlando, Florida 32813

1 Technical Reference Library
Naval Medical Research Institute
National Naval Medical Center
Bethesda, Maryland 20014

1 Dr. A.L. Slafkosky
Scientific Advisor (Code Ax)
Commandant of the Marine Corps
Washington, D.C. 20380

1 LCDR. Charles J. Theisen, Jr.,
MSC, USN
CSOT
Naval Air Development Center
Warminster, Pennsylvania 18974

ARMY

1 Behavioral Sciences Division
Office of Chief of Research and Development
Department of the Army
Washington, D.C. 20310

1 U.S. Army Behavior and Systems Research Laboratory
Rosslyn Commonwealth Building
Room 239
1300 Wilson Boulevard
Arlington, Virginia 22209

1 Director of Research
U.S. Army Armor Human Research Unit
ATTN: Library
Building 2422 Morade Street
Fort Knox, Kentucky 40121

1 COMMANDANT
U.S. Army Adjutant General School
Fort Benjamin Harrison, Indiana 46216
ATTN: ATSAG-EA

1 Armed Forces Staff College
Norfolk, Virginia 23511
ATTN: Library

1 Commanding Officer
ATTN: LTC Montgomery
USACDC - PASA
Ft. Benjamin Harrison, Indiana 46249

1 Director
Behavioral Sciences Laboratory
U.S. Army Research Institute of Environmental Medicine
Natick, Massachusetts 01760

1 Commandant
United States Army Infantry School
ATTN: ATSIN-H
Fort Benning, Georgia 31905

1 U.S. Army Research Institute
Room 239
Commonwealth Building
1300 Wilson Boulevard
Arlington, Virginia 22209
ATTN: Dr. R. Dusek

1 Mr. Edmund Fuchs
BESRL
Commonwealth Building, Room 239
1320 Wilson Boulevard
Arlington, Virginia 22209

AIR FORCE

1 Dr. Robert A. Bottenberg
AFHRL/PHS Lackland AFB
Texas 78236

1 AFHRL/MD
701 Prince Street
Room 200
Alexandria, Virginia 22314

1 AFOSR (NL)
1400 Wilson Boulevard
Arlington, Virginia 22209

1 COMMANDANT
USAF School of Aerospace Medicine
ATTN: Aeromedical Library (SCL-4)
Brooks AFB, Texas 78235

1 Personnel Research Division
AFHRL
Lackland Air Force Base
San Antonio, Texas 78236

1 Headquarters, U.S. Air Force
Chief, Personnel Research and
Analysis Division (AF/DPXY)
Washington, D.C. 20330

1 Research and Analysis Division
AF/DPXYR Room 4C200
Washington, D.C. 20330

1 CAPT Jack Thorpe USAF
Dept. of Psychology
Bowling Green State University
Bowling Green, Ohio 43403

DOD

1 Mr. Joseph J. Cowan, Chief
Psychological Research Branch
(P-1)
U.S. Coast Guard Headquarters
400 Seventh Street, S.W.
Washington, D.C. 20590

1 Dr. Ralph R. Canter
Director for Manpower Research
Office of Secretary of Defense
The Pentagon, Room 3D986
Washington, D.C. 20301

1 Dr. Charles Ullman
Chief of Counseling, Training
Programs
OSD (M&RA)
The Pentagon, Room 2C252
Washington, D.C. 20301

OTHER GOVERNMENT

1 Dr. Alvin E. Goins, Chief
Personality and Cognition Research Section
Behavioral Sciences Research Branch
National Institute of Mental Health
5600 Fishers Lane
Rockville, Maryland 20852

1 Dr. Lorraine D. Eyde
Bureau of Intergovernmental Personnel Programs
Room 2519
U.S. Civil Service Commission
1900 E. Street, NW
Washington, D.C. 20415

1 Office of Computer Information
Center for Computer Sciences and Technology
National Bureau of Standards
Washington, D.C. 20234

MISCELLANEOUS

1 Dr. Scarvia Anderson
Executive Director for Special Development
Educational Testing Service
Princeton, New Jersey 08540

1 Professor John Annett
The Open University
Waltonteale, BLETCHLEY
Bucks, England

1 Dr. Richard C. Atkinson
Department of Psychology
Stanford University
Stanford, California 94305

1 Dr. Bernard M. Bass
University of Rochester
Management Research Center
Rochester, New York 14627

1 Dr. David G. Bowers
Institute for Social Research
University of Michigan
Ann Arbor, Michigan 48106

1 Dr. Kenneth E. Clark
University of Rochester
College of Arts and Sciences
River Campus Station
Rochester, New York 14627

1 Dr. Rene V. Dawis
Department of Psychology
324 Elliott Hall
University of Minnesota
Minneapolis, Minnesota 55455

1 Dr. Robert Dubin
Graduate School of Administration
University of California
Irvine, California 92664

1 Dr. Marvin D. Dunnette
University of Minnesota
Department of Psychology
Elliott Hall
Minneapolis, Minnesota 55455

1 ERIC
Processing and Reference Facility
4833 Rugby Avenue
Bethesda, Maryland 20014

1 Dr. Victor Fields
Department of Psychology
Montgomery College
Rockville, Maryland 20850

1 Mr. Paul P. Foley
Naval Personnel Research and Development Laboratory
Washington Navy Yard
Washington, D.C. 20390

1 Dr. Albert S. Glickman
American Institutes for Research
8555 Sixteenth Street
Silver Spring, Maryland 20910

1 Dr. Bert Green
Department of Psychology
Johns Hopkins University
Baltimore, Maryland 21218

1 Dr. Richard S. Hatch
Decision Systems Associates, Inc.
11428 Rockville Pike
Rockville, Maryland 20852

1 Dr. M.D. Havron
Human Sciences Research, Inc.
Westgate Industrial Park
7710 Old Springhouse Road
McLean, Virginia 22101

1 Human Resources Research Organization
Division #3
Post Office Box 5787
Presidio of Monterey, California 93940

1 Human Resources Research Organization
Division #4, Infantry
Post Office Box 2086
Fort Benning, Georgia 31905

1 Human Resources Research Organization
Division #5, Air Defense
Post Office Box 6057
Fort Bliss, Texas 79916

1 Library
HumRRO Division Number 6
P.O. Box 428
Fort Rucker, Alabama 36360

1 Dr. Lawrence B. Johnson
Lawrence Johnson and Associates, Inc.
2001 "S" Street, NW
Suite 502
Washington, D.C. 20009

1 Dr. Norman J. Johnson
Associate Professor of Social Policy
School of Urban and Public Affairs
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

1 Dr. Roger A. Kaufman
Graduate School of Human Behavior
U.S. International University
8655 E. Pomerada Road

1 Dr. E.J. McCormick
Department of Psychological Sciences
Purdue University
Lafayette, Indiana 47907

1 Dr. Robert R. Mackie
Human Factors Research, Inc.
Santa Barbara Research Park
6780 Cortona Drive
Goleta, California 93017

1 Dr. Stanley M. Nealy
Department of Psychology
Colorado State University
Fort Collins, Colorado 80521

1 Mr. Luigi Petrullo
2431 North Edgewood Street
Arlington, Virginia 22207

1 Dr. Robert D. Pritchard
Assistant Professor of Psychology
Purdue University
Lafayette, Indiana 47907

1 Psychological Abstracts
American Psychological Association
1200 Seventeenth Street, N.W.
Washington, D.C. 20036

1 Dr. Diane M. Ransey-Klee
R-K Research & System Design
3947 Ridgemont Drive
Malibu, California 90265

1 Dr. Joseph W. Rigney
Behavioral Technology Laboratories
University of Southern California
3717 South Grand
Los Angeles, California 90007

1 Dr. Leonard L. Rosenbaum, Chairman
Department of Psychology
Montgomery College
Rockville, Maryland 20850

1 Dr. George E. Rowland
Rowland and Company, Inc.
Post Office Box 61
Haddonfield, New Jersey 08033

1 Dr. Benjamin Schneider
Department of Psychology
University of Maryland
College Park, Maryland 20742

1 Dr. Arthur I. Siegel
Applied Psychological Services
Science Center
404 East Lancaster Avenue
Wayne, Pennsylvania 19087

1 Dr. Henry Solomon
George Washington University
Department of Economics
Washington, D.C. 20006

1 Dr. David Weiss
University of Minnesota
Department of Psychology
Elliott Hall
Minneapolis, Minnesota 55455

1 Mr. Edmond Marks
109 Grange Building
Pennsylvania State University
University Park, Pennsylvania 16802

1 LCOL Austin W. Kibler, Director
Human Resources Research Office
ARPA
1400 Wilson Boulevard
Arlington, Virginia 22209

1 Dr. Anita S. West
Denver Research Institute
University of Denver
Denver, Colorado 80210

1 Century Research Corporation
4113 Lee Highway
Arlington, Virginia 22207

1 Dr. Kenneth E. Young
Vice President
American College Testing Program
Suite 340
One Dupont Circle, N.W.
Washington, D.C. 20036

1 Major Raymond Pericola
Chief, Public Services Branch
Community College of the Air Force
Randolph Air Force Base, Texas 78148

PLANNING COMMITTEE FOR THE OFFICE OF NAVAL RESEARCH PROGRAM IN MANPOWER R&D

1 Dr. Robert J. Lundegard (Chairman)
Director
Mathematical and Information Sciences Division
Code 430

1 LCDR Robert D. Matulka
Research Program Officer
Code 430C

1 Dr. Thomas C. Varley
Program Director Operations Research
Code 434

1 Mr. Marvin Denicoff
Program Director Information Systems
Code 437

1 Dr. Glenn L. Bryan (Program Manager) Director
Psychological Sciences Division
Code 450

1 Dr. H. Wallace Sinaiko
Research Study Director
Code 450

1 Dr. John A. Nagay
Director Organizational Effectiveness Research Programs
Code 452

1 Dr. Bert T. King
Associate Director
Code 452

1 Dr. Martin A. Tolcott
Director Engineering Psychology Programs
Code 455

1 Mr. Robert J. Miller
Director Naval Analysis Programs
Code 462

1 Mr. J. Randolph Simpson
Supervisory Operations Research Analyst
Code 462

CONTRACTORS, OFFICE OF NAVAL RESEARCH MANPOWER R&D PROGRAM

1 Dr. E.A. Fleishman
American Institutes for Research
8555 Sixteenth Street
Silver Spring, Maryland 20910

1 Mr. Philip G. Bernard
B-K Dynamics, Inc.
2351 Shady Grove Road
Rockville, Maryland 20850

1 Dr. Barry M. Feinberg
Bureau of Social Science Research, Inc.
1200 Seventeenth Street, N.W.
Washington, D.C. 20036

1 Prof. Robert M. Oliver
University of California
Operations Research Center
Berkeley, California 94720

1 Mr. John P. Thomas
Hudson Institute
Quaker Ridge Road
Croton-on-Hudson, New York 10520

1 Mr. James N. Kelly
Management Analysis Center, Inc.
745 Concord Avenue
Cambridge, Massachusetts 02138

1 Dr. Lawrence Friedman
MATHEMATICA, Inc.
P.O. Box 2392
Princeton, New Jersey 08540

1 Dr. Jack R. Borsting
Department of Operations Research
Naval Postgraduate School
Monterey, California 93940

1 Prof. G.S. Watson
Princeton University
Department of Statistics
Princeton, New Jersey 08540

1 Mr. R. Bard Battelle
Stanford Research Institute
Naval Warfare Research Center
Menlo Park, California 94025

1 Dr. Gloria L. Grace
System Development Corporation
2500 Colorado Avenue
Santa Monica, California 90406

1 Dr. Leonard Carmichael
The Smithsonian Institution
Washington, D.C. 20560

ORI
Operations Research, Inc. A LEASCO Company